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DISCUSSION PAPER SERIES

IZA DP No. 16105

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ABSTRACT

A Tale of Two Bankruptcies: Geographic Differences in Bankruptcy Chapter Choice*

The importance of place of birth or residence on a host of economic outcomes cannot be overstated. The treatment of households in consumer bankruptcy appears to be no different. Despite the U.S. Bankruptcy Code being federal law, there is extreme geographic variation in the relative use of the two types of consumer bankruptcy – Chapter 7 and Chapter 13 – and these differences lead to disparities in bankruptcy's balance between debt relief and creditor repayment. Guided by the legal literature, we develop a framework to decompose the geographic variation into three potential sources: (i) differences in filer characteristics, (ii) differences in how courts steer filers based on those characteristics, and (iii) differences in how frequently filers deviate from court steering. The results reveal that heterogeneity surrounding a single characteristic, disposable income, explains most of the geographic variation in chapter choice. Moreover, we show that disposable income plays an important and overlooked role in screening within the bankruptcy system, and we discuss the legal mechanisms behind this screening. Finally, we explore the consequences of improving uniformity in the bankruptcy system.

JEL Classification: D31, G28, G51, R59

Keywords: bankruptcy, chapter choice, regional disparities

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1 Introduction

Where you grow up or live matters for a host of vital outcomes: earnings, education, marriage, healthcare utilization, mortality, and more (see, e.g., Chetty *et al.*, 2016; Finkelstein *et al.*, 2016a; Chetty and Hendren, 2018; Finkelstein *et al.*, 2021).[1] It also appears to matter greatly for consumer bankruptcy. Around 700,000 U.S. households file for bankruptcy every year, seeking relief from more than $100 billion in liabilities. These debtors either enter Chapter 7, where they typically repay nothing to unsecured creditors, or Chapter 13, where they enter a strict multi-year repayment plan.[2] The regional differences in the relative use of these chapters, and the ensuing differences in debt relief and creditor repayment, are striking. Across the 94 federal court districts, the share of bankruptcies filed under the debtor-friendly Chapter 7 ranges from only 20% to nearly 95%.

In this paper, we aim to quantify the sources of this extreme geographic variation in bankruptcy chapter choice. This matters because the specific sources driving the variation determine how the generosity of bankruptcy varies across individuals and locations. Additionally, understanding the sources is a critical input for national policy proposals, many of which aim to alter the relative use of the two chapters or to increase uniformity in bankruptcy.[3]

We are not the first to recognize the extent of the geographic heterogeneity in chapter choice. Nonetheless, the underlying sources of this heterogeneity remain unclear. Keys *et al.* (2020) find that location-specific fixed effects explain a significant share of the geographic variation in bankruptcy, but there are not clear legal or economic factors that strongly correlate with these fixed effects. Additional studies examine the role of specific financial or legal factors affecting individual bankruptcy decisions, including asset exemptions (Pattison and Hynes, 2020), liquidity constraints (Gross *et al.*, 2014; Foohey *et al.*, 2016), traffic debt (Foohey *et al.*, 2020; Morrison *et al.*, 2020), and payday loans (Skiba and Tobacman, 2019). Others assess the role of informal attorney steering into Chapter 7 or Chapter 13 based on the attorney's incentives (Lefgren *et al.*, 2010; McIntyre *et al.*, 2015) or the filer's race (Dickerson, 2012; Braucher *et al.*, 2012a,b). A complementary body of legal research emphasizes the role of *local legal culture* in shaping how courts interpret and apply the uniform federal bankruptcy law (Braucher, 1993; Sullivan *et al.*, 1994;

[1] Chyn and Katz (2021) and Deryugina and Molitor (2021) provide recent reviews of the literature on place-based effects.

[2] Between 2000 and 2013, the average disbursement to unsecured creditors per Chapter 7 case was less than $400, with half of the disbursements coming from just 0.3% of Chapter 7 cases (Hynes and Pattison, 2022).

[3] The 2005 Bankruptcy Reform's flagship feature, the means test, encouraged Chapter 13 over Chapter 7. Recent policy proposals, such as Senator Warren's proposed bankruptcy reform, seek to reverse this feature of the 2005 Reform or even eliminate Chapter 13 as an option (Warren, n.d.). American Bankruptcy Institute's 2017-2019 Commission on Consumer Bankruptcy, a committee of bankruptcy judges, trustees, and attorneys concluded that "nonuniform practices are a problem in the bankruptcy system that should be minimized to the greatest extent possible" (American Bankruptcy Institute, 2019).

Lawless and Littwin, 2017). This research highlights specific filer characteristics, state laws, and local legal cultures that influence chapter choice, but it remains unknown which of these factors, if any, explain the *geographic variation* in chapter choice.

Guided by the existing economic and legal research, we develop a framework to quantify the sources of geographic variation in chapter choice across the U.S. federal court districts. To begin, we model the *steering* decision by each district's bankruptcy professionals (judges, trustees, and attorneys). These professionals steer bankruptcy filers into either Chapter 7 or Chapter 13 based on the filers' characteristics and the prevailing local legal culture. The filer characteristics capture the primary legal barriers, financial factors, and demographic factors known to affect chapter choice. To incorporate local legal culture, we allow for district-specific parameters, which allow districts to differentially weight filer characteristics when assessing a filer's suitability for each chapter. In this respect, our approach is more flexible than existing bankruptcy models that either restrict parameters determining chapter choice to be identical across districts (Domowitz and Sartain, 1999; Gross and Souleles, 2015; Miller, 2019) or capture geographic variation only through a location-specific constant (Lawless and Littwin, 2017).

Since the debtor is the ultimate decision-maker regarding chapter choice, we augment the model to allow filers to *deviate* from the district's preferred chapter. Specifically, while filer characteristics and district-specific parameters determine into which chapter the district steers filers, our framework explicitly models the ability of filers to deviate from this steering. These deviations were first included in the chapter choice model of Hackney and Friesner (2015), which examines chapter choice in a single district. We extend this by using data on more than seventy districts and allowing the frequency of these deviations to vary across districts.

We use case-level data on the universe 2010-2014 consumer bankruptcies to estimate these district-specific models of chapter choice and recover the coefficients and deviation rates. We then extend the Blinder-Oaxaca decomposition method to decompose the cross-district geographic variation in chapter choice into three sources: (i) differences in the distributions of filer characteristics, (ii) differences in the district-specific parameters (local legal culture), and (iii) differences in the district-specific deviation rates.

Our results reveal the sources generating the geographic differences in the share of bankruptcies filed under Chapter 7 in each district. First, we find that 61% of the geographic variation in chapter choice is explained by filer characteristics. Local legal culture, reflecting differences across districts in the sorting of filers conditional on these characteristics, explains 15%, and the district-specific deviation rates explain the remaining 24%. Although our approach differs, this broad decomposition is consistent with the im-

portance of individual and place-based factors found in Keys *et al.* (2020). Second, our analysis reveals that incorporating filer deviations into the model is quantitatively important; differences in deviation rates account for 24% of the geographic variation in chapter choice. Moreover, consistent with our interpretation of the deviation rates, we find that the frequency of deviations is associated with how often a district's courts reject cases deemed to be in the "wrong" chapter. Third, not only does our analysis quantify the portion of the geographic variation that is due to each of the three factors listed above, but it also reveals new insights into how the bankruptcy system operates. Some features of bankruptcy emphasized in the academic literature (e.g., asset exemptions and the formal mean test) explain almost none of the geographic variation in chapter choice, while an overlooked factor – disposable income (income less allowable expenses) – plays a dominant role.

The fact that we find no role of asset exemptions in explaining the geographic variation is perhaps surprising; this is the legal barrier most emphasized in the bankruptcy literature. However, we show this result can be reconciled with existing evidence. In contrast, the large majority of the geographic variation is due to differences surrounding a single variable: filers' disposable income. Filers with high disposable income nearly always enter Chapter 13, while those with low disposable income enter Chapter 7. Thus, disposable income effectively acts as a means test applied to all bankruptcy filers, apart from the formal means test introduced with the 2005 Bankruptcy Reform. This sorting pattern holds across all districts, but districts differ in their thresholds for what constitutes 'high' disposable income, as well as how easily filers can deviate from the district's steering based on disposable income.

The prominent role of disposable income in the chapter choice decision has crucial implications. Current conventional wisdom is that filers are free to choose between Chapter 7 and Chapter 13 as long as they pass the formal means test. In reality, rather than facing a choice, our results indicate that many filers' bankruptcy chapter is dictated by their disposable income. Chapter 7 filers with disposable income that is too high frequently have their cases dismissed or converted to Chapter 13. As a result, access to the more debtor-friendly Chapter 7 is more restricted than believed under the prevailing view of bankruptcy. Additionally, the fact that disposable income dictates chapter choice for many filers, which can help resolve questions about why some filers enter Chapter 13 despite Chapter 7 providing a greater financial benefit. We discuss and provide additional evidence of the legal mechanisms behind the importance of disposable income in chapter choice.

Our results should also prove useful for quantitative models of consumer bankruptcy by clarifying which institutional features do and do not matter for the determination of chapter choice (see, e.g., Athreya, 2006;

Li and Sarte, 2006; Livshits *et al.*, 2007; Chandra and Staiger, 2007; Pavan, 2008; Chatterjee and Gordon, 2012; Hintermaier and Koeniger, 2016; Mitman, 2016; Li *et al.*, 2022).[4] Additionally, the fact that districts differ in the implicit threshold for steering based on disposable income as well as how frequently they 'allow' filer deviations from this steering is useful for policies that aim to increase uniformity within the bankruptcy system.

To highlight the important role of heterogeneity in sorting based on disposable income, we conclude our analysis by examining a *parsimonious* model in which districts exogenously differ in only their sorting on disposable income and deviation rates. Although simple, this model captures the vast majority of geographic variation in chapter choice, both in the sample from 2010-2014 and out of sample using predictions from 2015-2017. Moreover, the parsimonious model significantly outperforms a model with no heterogeneity in district steering or deviation rates. Finally, we are able to examine the implications of increased uniformity in legal culture by examining how Chapter 7 rates, average discharges, and average recoveries would change if all districts had uniform steering on disposable income. These results show how increasing uniformity within the bankruptcy system would affect the competing goals of debt relief and creditor repayment.

This paper adds to the literature on the impact of location on consumer credit outcomes and financial distress (Lefgren and McIntyre, 2009; Brown *et al.*, 2019; Miller and Soo, 2021; Keys *et al.*, 2020). Our paper complements this literature by identifying the underlying sources that lead to geographic variation in bankruptcy chapter choice. In addition, our analysis builds on two literatures on bankruptcy and chapter choice that have remained largely distinct. Research in finance and economics centers on binary choice models of bankruptcy decisions that incorporate realistic features of the bankruptcy code, financial characteristics, and state laws such as garnishment restrictions and asset exemptions (Domowitz and Sartain, 1999; Gross and Souleles, 2015; Dawsey *et al.*, 2013; Eraslan *et al.*, 2017; Miller, 2019). Research in law largely focuses on the role of local legal culture, emphasizing how districts may steer filers differently even when filers' characteristics and the state laws are similar (Braucher, 1993; Sullivan *et al.*, 1994; Lawless and Littwin, 2017). Leveraging a much larger sample – the universe of bankruptcy filers – we were able to bridge these two literatures by allowing for district-specific parameters, reflecting local legal culture, within a binary choice model incorporating financial and legal barriers as well as filer deviations. Finally, our methods and goals relate to the large literature seeking to understand persistent geographic variation in health care and whether more uniformity is desirable (Skinner, 2011; Chandra and Staiger, 2007; Finkelstein

[4]See Exler and Tertilt (2020) for a recent review of the broader literature on quantitative macroeconomic models of bankruptcy.

et al., 2016b; Currie and MacLeod, 2017; Chandra and Staiger, 2020).

2 Background

In the U.S., consumers choose to file for bankruptcy under either Chapter 7 or Chapter 13.[5] In Chapter 7, debtors obtain a quick discharge of most unsecured debts. In exchange, they must repay creditors using any nonexempt assets, but 94% of Chapter 7 filers have zero nonexempt assets and repay nothing to unsecured creditors. In Chapter 13, debtors enter a 3-5 year plan during which they repay creditors out of their disposable income. Upon completion of the plan, Chapter 13 filers obtain a discharge of remaining unsecured debts. Roughly 50% of debtors in Chapter 13 do not complete their plan, mostly because they miss scheduled payments. If a debtor fails to complete their plan, they forego any discharge of debts that would have occurred at plan completion. Thus, Chapter 7 typically results in significant debt relief and little creditor repayment, while Chapter 13 results in much less debt relief and more creditor repayment. As a result, chapter choice is the key factor determining the balance between debt relief and creditor repayment in bankruptcy.

2.1 Geographic Variation in Chapter Choice

Although the U.S. bankruptcy code is primarily a uniform federal law, there is tremendous geographic variation in the relative use of the two bankruptcy chapters.[6] The bankruptcy system is administratively divided into 94 federal court districts, and a debtor must file for bankruptcy in the district where they reside. Across the 94 districts, the share of bankruptcies filed in 2010 under Chapter 7 varies from only 25% to more than 90%. Within a district, the relative use of the two chapters is extremely persistent. For example, the correlation coefficient between the 1990 and 2010 district-level shares of bankruptcies under Chapter 7 is 0.70 (Appendix Figure A1), despite changes over this time period to credit markets, economic conditions, and the bankruptcy law itself.

These differences in chapter choice lead to very different outcomes for debtors and creditors. The share of bankruptcies that successfully obtain a discharge is much higher in Chapter 7 (96% in 7 vs. 43% in 13), while the recovery rate on unsecured debt is much lower in Chapter 7 (0.5% in 7 vs. 13% in 13).[7]

[5] Debtors can also file under Chapter 11 or Chapter 12, but these account for less than 0.5% of consumer bankruptcy filings.

[6] As we discuss below, the one notable exception to the uniformity of bankruptcy law is that states are allowed to set their own asset exemptions levels.

[7] Authors estimates. We combine data from Trustee Final Reports, which detail actual payments to general unsecured creditors, with data from the Federal Judicial Center's Integrated Database. As Trustee Reports are often shared among districts within a state, we aggregate data to the state level in Figure 1. See Appendix Figure A2 for these graphs separated by chapter. See Morrison and Uettwiller (2017) for estimates from other samples of recoveries in Chapter 13.

As a result, high Chapter 7 districts have more debt relief and less debt repayment on average. Figure 1 shows that filers are more likely to obtain a discharge in states with a high Chapter 7 incidence (Panel A), but creditors recover a lower share of unsecured debt in bankruptcy (Panel B). Figure 1 also reveals that districts with the lowest Chapter 7 share are in the South. The goal of this paper is to understand the sources of these large geographic differences in chapter choice.

2.2 Potential Sources of Variation in Chapter Choice

The chapter choice decision depends on features of both the debtor and the district in which the debtor resides. The Bankruptcy Code allows the debtor and the debtor's attorney to decide which chapter to file under; the costs and benefits of each chapter depend on the debtor's characteristics. After a debtor chooses a chapter, the district's bankruptcy trustees and judges review the filing, and can request additional information or dismiss the case if it is deemed ineligible. Aware that the filing will undergo scrutiny, the debtors' attorneys will steer the debtor into a chapter that meets the standards of the district's judges and trustees. There are persistent differences across districts in these standards and steering, which the legal literature refers to as the local legal culture (Braucher, 1993; Sullivan *et al.*, 1994; Westbrook, 1998; Lawless and Littwin, 2017; American Bankruptcy Institute, 2019). However, as the debtor is the ultimate decision-maker regarding chapter choice, debtors may resist this steering, leading debtors to deviate from the chapter preferred by the bankruptcy professionals in the district. In sum, chapter choice decisions depend on filer characteristics, the district's local legal culture, and the propensity for filers to successfully deviate from the chapter preferred by district actors. Observed geographic variation in chapter choice reflects the cumulative effects of these factors.

Filer Characteristics

Geographic variation in chapter choice may arise because the characteristics of filers differ across districts. Offering quick debt relief and little repayment, Chapter 7 is the better option for most debtors. However, legal barriers may restrict the chapter choice of some filers. There are also three main legal barriers to chapter choice: nonexempt assets, the means test, and screening on disposable income. First, Chapter 7 requires the debtor to liquidate all assets that exceed certain exemption levels that are defined in state and federal law. These asset exemption laws vary widely across states. The largest exemption, which protects home equity, varies from less than $10,000 to more than $500,000 (and is unlimited in

seven states).[8] While filers with nonexempt equity or personal assets are allowed to file for Chapter 7, they seldom do.[9] Second, a formula-based means test restricts access to Chapter 7. A debtor may file in Chapter 7 if (i) their annualized income over the six months prior to filing is below the median in the filer's state, adjusted for household size, or (ii) the debtor's disposable income is not too high. Failing this test creates a "presumption of abuse" and the debtor is barred from Chapter 7 unless they can rebut this presumption by claiming special circumstances (e.g., recent job loss or medical expenses). These two legal barriers – asset exemptions and the means test – are highlighted in bankruptcy research.

The third legal barrier to chapter choice is also based on the debtor's disposable income, but is independent of the formal means test. A Chapter 7 case can be dismissed if it is deemed abusive under the "totality of the circumstances," and the most important factor in this test is whether the debtor has sufficient disposable income to repay creditors (Waxman and Rucki, 2008; Landry III, 2008; US DOJ, 2012).[10] This totality test applies to all filers, "even if a case is determined not to be 'presumed abusive' under the means test calculation" (Committee on the Judiciary, 2007).[11] These trustee enforcement actions are common. Between fiscal year 2010 and 2016, which overlaps with our analysis period, trustees took nearly 60,000 formal enforcement actions and 155,000 informal actions (i.e., documented inquiries) that led to more than $11 billion in debts not being discharged, fines, and other remedies (USTP, 2016). Conversely, in Chapter 13, a case can be dismissed if the filer's disposable income is too low. Chapter 13 filers repay out of disposable income, and some trustees oppose Chapter 13 plans that repay less than a certain percentage (Braucher, 1993; Morrison and Uettwiller, 2017; Morrison *et al.*, 2020). In sum, filers with high disposable income may be barred from Chapter 7, while filers with low disposable income may be barred from Chapter 13.[12]

Even if a filer is eligible for Chapter 7, some may prefer Chapter 13. Homeownership, secured debt, and some types of nondischargeable debts make Chapter 13 more attractive because debtors are better

[8] Another important aspect of home protection is tenancy-by-the-entirety, which provide additional protection for married filers (Traczynski, 2019). The district-specific coefficients on the indicator for joint filings capture the role of these tenancy-by-the-entirety laws.

[9] Only 6% of Chapter 7 filings have any nonexempt assets, and the most commonly seized asset is a small tax rebate (Flynn *et al.*, 2003; Jiménez, 2009). Among the 6% of cases with nonexempt assets, the median amount liquidated is less than $2,000 and only 0.1-0.2% of Chapter 7 filings have nonexempt home equity (Pattison, 2020).

[10] The bankruptcy trustee, acting as the "watchdog over the bankruptcy process" USTP (2022), reviews each case and can move to have it dismissed without discharge or converted to a different chapter if the case is deemed abusive. A judge then reviews the trustee's claim, siding with the trustee in more than 98.5% of enforcement actions that were decided by judicial review or consent (USTP, 2015).

[11] See Appendix B for quotes discussing this test. See In re Pennington, 348 B.R. 647, 65152 (Bankr. D. Del. 2006) for an example of the totality of the circumstances test applied to below-median income filers.

[12] There are other factors that restrict chapter choice as well, including time limits and debt limits on filing. These restrictions have little effect on our analysis as we exclude filers who report a prior bankruptcy filing within the past eight years or who exceed the Chapter 13 debt limits.

able to deal with delinquent secured debt and threats of repossession or foreclosure (Porter, 2011; Tabb, 2020). Chapter 13 also has lower upfront fees, which may be important to liquidity-constrained debtors (Gross *et al.*, 2014; Foohey *et al.*, 2016). Debtors may also prefer Chapter 13 if they feel an obligation to repay some of their debt (Braucher, 1993; Porter, 2011), even though this does not translate into better credit scores (Jagtiani and Li, 2015).

Local Legal Culture

Geographic variation in chapter choice may also arise due to heterogeneity in the local legal culture that creates differences in how debtors are sorted into chapters (holding their characteristics constant). This local culture refers to the shared and persistent view of local attorneys, judges, and trustees about how to interpret and apply the law (Braucher, 1993; Sullivan *et al.*, 1994; Westbrook, 1998; Lawless and Littwin, 2017; American Bankruptcy Institute, 2019). As early as the 1960s, geographic differences in chapter choice have been attributed to differences in the views of local bankruptcy practitioners (McDuffee, 1961; Haden, 1966).

These cultural differences can lead to differences in how legal barriers are enforced because those implementing these barriers depend on the discretion of the district's judges and trustees. Trustees can differ in how aggressively they seek creditor recoveries and pursue nonexempt assets (Morrison *et al.*, 2019). Under the formal means test, trustees exercise discretion when evaluating mitigating circumstances and decline to seek dismissal in 60% of presumptively abusive cases (USTP, 2012). Under the totality of circumstances test, districts differ in how ability to pay is assessed and investigated (Landry III, 2008, 2014). Trustees also vary in their informal requirement of a minimum percentage of repaid unsecured debt for debtors to file in Chapter 13 (Braucher, 1993; Morrison and Uettwiller, 2017; Morrison *et al.*, 2020). Legal culture can also affect steering by attorneys through, for example, altering attorney fees (Lefgren *et al.*, 2010), time or hassle costs (Sullivan *et al.*, 1994), filer fee structures (Foohey *et al.*, 2016), differential steering based on race (Braucher *et al.*, 2012a), or differences in which benefits from bankruptcy professionals emphasize. All of these factors can lead to observationally equivalent filers being sorted differently based on the prevailing legal culture of the district in which they file.

Deviating Behavior

While the local legal culture creates an environment whereby debtors may be steered in a particular direction, the debtor has the final say over which chapter to file under. The ability of a filer to resist

the steering from local bankruptcy professionals is likely to vary across districts. This variation may arise due to differences in the effort put forth to steer debtors in the first place, as well as differences in the propensity for trustees and judges to dismiss cases they deem as abusive or ineligible under a given chapter (see Section 5.3). Debtors can come to attorneys with strong preferences about chapter choice (Braucher, 1993), and attorneys can also specialize in certain chapters (Lefgren *et al.*, 2010), causing some filers to file under a chapter that is different than the one preferred by the local legal culture. Differences in filers' willingness to deviate from where they are being steered, and differences across districts in permitting such deviations, will also lead to observationally equivalent debtors filing in different chapters across districts.

3 Data

The data are from the Federal Judicial Center's (FJC) Integrated Database. The database contains all bankruptcy cases filed in fiscal years 2008 through 2020. We restrict the sample to new consumer Chapter 7 or Chapter 13 cases filed between 2010 and 2014, which provides enough of a post-period for us to observe whether Chapter 13 plans are successfully completed. We also exclude cases with missing data, extreme outliers, and those that cannot file certain chapters because of debt limits or recent filings.[13] Our strategy requires within-district variation in nonexempt home equity, so we exclude 15 districts in the seven U.S. states with unlimited homestead exemptions to allow examination of the impact of holding nonexempt home equity on filing decisions.[14] Our final sample consists of roughly 3 million Chapter 7 cases and 0.9 million Chapter 13 cases filed between 2010 and 2014 across 73 federal districts.

For each case in our sample, we construct case-specific variables to capture the important determinants of chapter choice.[15] The first set of characteristics capture the three legal barriers to chapter choice (see Section 2). We include the filer's disposable income, which captures the impact of the totality of the circumstances test and the minimum required repayment amount in Chapter 13.[16]. For the means test, we include an indicator for whether the filer reports above-median income for their state and its interaction with the filer's disposable income.[17] To capture nonexempt assets, we calculate each filer's nonexempt

[13]Specifically, we exclude cases with missing data on characteristics (5.7% of cases), missing plan duration (0.3% of cases, typically transfers), those involving individuals with assets or debts exceeding $5 million or monthly income or expenses exceeding $50,000 (0.2% of remaining cases), cases in which debts exceed the limits for Chapter 13 (2.2% of remaining cases) or in which individuals report a bankruptcy filing within the previous eight years (13.3% of remaining cases).

[14]We also exclude the districts covering Washington D.C. and the U.S. territories.

[15]To reduce the influence of extreme outliers, all financial variables are winsorized at the 99^{th} percentile, and the 1^{st} and 99^{th} percentile for disposable income.

[16]Disposable income is defined as Schedule I income less Schedule J expenses, adjusted for conduit districts as discussed in Appendix C.

[17]Above-median income is constructed using the filer's "current monthly income" which is the six-month average used in the means test. For the disposable income portion of the means test, captured by the interaction of the above-median indicator

equity following Pattison and Hynes (2020).[18] We also include the value of the filer's personal (non-real-estate) assets as a proxy for other nonexempt assets.[19] Table 1 shows that the differences in these variables across Chapter 7 and Chapter 13 filers are consistent with the legal restrictions to chapter choice. Chapter 13 filers tend to have significantly higher disposable incomes, are nearly twice as likely to have above-median income for their state, and have more nonexempt equity and other personal assets.

We also include a set of variables capturing the broader financial characteristics and incentives of filers. Filer's assets-to-income and debt-to-income ratios reflect the impact of overall assets and liabilities. An indicator for homeownership, the amount of negative equity, and the share of total outstanding debt that is secured capture the desire to retain a house or other secured assets.[20] We control for the filer's share of debt that is nondischargeable because holding these debts may incentivize Chapter 13, which offers a plan for filers to organize and catch up on delinquent nondischargeable debts. Finally, we include an indicator for whether the case involves joint filers (as opposed to a single filer) and the percentage of Black residents in the filer's zip code. The residential shares of Blacks in the filer's zip code is used as a proxy for the race of the filer as studies have documented racial differences in chapter choice (Braucher *et al.*, 2012a; Lawless and Littwin, 2017), yet individual race is not available in the data. Table 1 reveals that differences across Chapter 7 and Chapter 13 filers are consistent with home ownership and secured debt being important factors in chapter choice. Specifically, Chapter 13 filers are much more likely to be homeowners and secured debts make up a greater share of their total debts. Racial differences in chapter choice are also evident, with Chapter 13 filers more likely to reside in zip codes with a higher share of Black residents.

4 Model and Empirical Strategy

We begin by modeling chapter choice within a district. Taking the decision to file for bankruptcy as exogenous, the district steers debtors into a preferred chapter according to the local legal culture. However, steering is imperfect and filers may deviate from the chapter preferred by the district. This framework yields an estimating equation that is mathematically equivalent to a binary choice model with misclassification (Hausman *et al.*, 1998). Allowing preferences and deviation rates to be district-specific, we develop an extended Blinder-Oaxaca decomposition to decompose variation in Chapter 7 filing rates into portions

and disposable income, we approximate the formula used in the actual means test as detailed in Appendix G.3.1.

[18] Specifically, nonexempt equity is defined as $\max\{\text{real property value} - \text{secured debt} - \text{homestead exemption}, 0\}$, applying the married homestead exemption to joint filers and the single homestead exemption to single filers. If both federal and state exemptions are available, we take the maximum of the two. Pattison and Hynes (2020) finds that this approximation for home equity is highly correlated with actual home equity reported on bankruptcy forms.

[19] Total personal assets is defined as total assets less real property.

[20] The amount of positive equity is partially captured by *nonexempt home equity*.

attributable to (i) district preferences, (ii) filer characteristics, and (iii) district deviation rates.

4.1 Model of Chapter Choice

District Preferences

The district steers filers into particular bankruptcy chapters based on filers' characteristics and the district's preferences. Let π_{id} be district d's view of the suitability of filer i for Chapter 7 relative to Chapter 13, defined as

$$\pi_{id} = \beta_{0d} + x_i^l \beta_{ld} + x_i^f \beta_{fd} + \epsilon_{id}. \tag{1}$$

If $\pi_{id} \geq 0$, district d prefers that debtor i file under Chapter 7. The covariates x_i^l and x_i^f are, respectively, the legal barriers and financial/demographic characteristics of filer i from Table 1. The coefficients β_{0d}, β_{ld}, and β_{fd} capture the local legal culture, i.e., how district d enforces the legal barriers and weights the filer's financial characteristics (see Section 2.2). These district-specific coefficients add substantial flexibility compared to existing models of chapter choice, which either restrict all coefficients to be identical across districts (Domowitz and Sartain, 1999) or only allow the intercept to vary across districts (Lawless and Littwin, 2017). The error term ϵ_{id} captures the role of unobserved variables or random noise in the districts' view of filers' suitability to each chapter. Thus, whether district d prefers filer i in Chapter 7 or Chapter 13 depends on the filer's observed characteristics, district d's legal culture as reflected in the parameters, and the error term.

The goal of the model is to identify the sorting preferences of each district. To do this, we assume that the error term is drawn from a standard normal marginal distribution, $\epsilon_{id} \sim N(0, 1)$, in each district d. This entails two key restrictions. First, it requires that the error term is independent of the observable characteristics. This will be satisfied if our variables replicate the information set used by districts to sort filers, which we cover quite well since our variables include the information reported on the two forms designed by the courts to summarize the detailed, full bankruptcy petition. Consistent with our variables covering much of the information set, our estimated models explain the large majority of the variation in chapter choice. That said, the courts likely observe more information than we do as we are missing some variables known to affect chapter choice such as the amount of delinquent secured debt or traffic debt (Morrison *et al.*, 2020). These omitted variables may bias our estimates. However, the impact of such bias on our results is mitigated because our strategy compares *differences* in coefficients across districts, so similar biases will partially cancel out.

Second, the assumption requires that the error term is homoskedastic across districts. The resulting probit model identifies the district's preference coefficients normalized by the district's standard deviation. Therefore, with heteroskedasticity, differences in districts' estimates would reflect the combination of differences in their preferences and their error variances.[21] This is not necessarily problematic if the heteroskedasticity itself reflects local legal culture. This would be the case if the heteroskedasticity arises due to differential effects of unobserved determinants on chapter preference (e.g., different coefficients on unobserved traffic debt), or if the amount of random noise in the process is a deliberate choice of the district.

With this setup, district d prefers filer i in Chapter 7, denoted by $c^*_{id} = 1$, if $\pi_{id} \geq 0$ and in Chapter 13, denoted by $c^*_{id} = 0$, otherwise. That is, the chapter preferred by the district is $c^*_{id} = \mathtt{I}(x_i\beta_d + \epsilon_{id} \geq 0)$ where $x_i = \left[1 \; x_i^l \; x_i^f\right]$ and $\beta_d = [\beta_{0d} \; \beta_{ld} \; \beta_{fd}]'$. With $\epsilon_{id} \sim N(0,1)$, the probability that a district d prefers filer i in Chapter 7 is

$$\Pr(c^*_{id} = 1|x_i) = \Phi\left(x_i\beta_d\right), \tag{2}$$

where $\Phi(\cdot)$ is the standard normal cumulative distribution function. If filers always end up in the chapter preferred by the district (i.e., district steering is perfectly enforced), then c^*_{id} is observed and Equation (2) can be estimated using a standard probit model. In practice, steering by the district is imperfect and debtors may file under a chapter that is not the one preferred by the district.

Filer Deviations

The chapter choice decision is ultimately at the discretion of the debtor and the debtor's attorney. For example, a debtor with high disposable income, who the district would prefer in Chapter 13, may choose to file under Chapter 7. In such cases, the observed chapter choice of a filer will differ from the district's preferred chapter choice, implying that c^*_{id} is unobserved. As evidence that these deviations do occur, districts sometimes dismiss filings they deem inappropriate (examined in Section 5.3).

To allow for deviations, let c_{id} denote the actual chapter choice for filer i, equal to one if the debtor files under Chapter 7 and zero otherwise. The probability that the filer deviates from the district's preferred

[21] If ϵ is heteroskedastic across districts, there are two options. First, we can estimate Equation (1) using a linear probability model. In this case, the deviation rates, which we describe below, are no longer identified. Nonetheless, we report estimates from linear probability models in Appendix Table A2. Second, we could model the heteroskedasticity directly. We do not attempt this, however, given that identification of the variances and the deviation rates would both depend on the nonlinearity of the model.

choice is given by

$$\begin{aligned} \alpha_0^d &= \Pr(c_{id} = 1 | c_{id}^* = 0) \\ \alpha_1^d &= \Pr(c_{id} = 0 | c_{id}^* = 1). \end{aligned} \tag{3}$$

Equation (3) imposes constant deviation probabilities within a district conditional on the district's desired chapter choice. This assumption is primarily for tractability, and in reality some filers may have a stronger incentive to deviate from the district's preferred chapter.[22] Still, the assumption is reasonable if districts adjust the costs of deviation (e.g., through a greater risk of dismissal) across filers so that the net benefit of deviation is constant.

We refer to α_0^d and α_1^d as district-specific deviation rates. They will be heterogeneous across districts if districts differ in how strictly or successful they are at enforcing their preferences. For example, some districts heavily scrutinize filings, frequently dismissing or converting inappropriate cases. Because the probability of detecting abuse in such districts is high, deviation rates will be lower. In contrast, other districts may only loosely enforce their preferences, leading to higher deviation rates. We examine this empirically in Section 5.3. Differences in districts' deviation rates could reflect aspects of local legal culture, but they may also reflect how the appropriate level of scrutiny endogenously depends on the characteristics of the districts' filers. Thus, these deviation rates could be determined by both local legal culture and filer characteristics, which we examine further in Section 6.

Complete Model and Estimation

Combining the model for c_{id}^* in Equation (2) with the deviation probabilities in Equations (3), the probability of debtor i filing under Chapter 7 in district d is given by

$$\Pr(c_{id} = 1 | x_i) = \alpha_0^d + (1 - \alpha_0^d - \alpha_1^d)\Phi(x_i\beta_d) = \alpha_0^d + \tilde{\alpha}_1^d \Phi(x_i\beta_d), \tag{4}$$

where $\tilde{\alpha}_1^d = (1 - \alpha_0^d - \alpha_1^d)$. These probabilities form the basis of district-specific likelihood functions, enabling estimation of α_0^d, α_1^d, and β_d by maximum likelihood (ML) separately for each district.[23] The

[22] In principle one could relax this assumption, allowing the deviation probabilities to depend on filer (or other) observed attributes in addition to c_{id}^*, as discussed in Lewbel (2000). Convergence of the empirical models, however, is tenuous.

[23] The district-specific likelihood function is given by

$$\ln \mathscr{L}_d = \sum_{i \in d} \left\{ c_{id} \ln \left[\alpha_0^d + \left(1 - \alpha_0^d - \alpha_1^d\right) \Phi\left(x\beta_d\right) \right] \right\} + \sum_{i \in d} \left\{ (1 - c_{id}) \ln \left[\alpha_0^d + \left(1 - \alpha_0^d - \alpha_1^d\right) \Phi\left(x\beta_d\right) \right] \right\}.$$

likelihood function is identical to that proposed in Hausman *et al.* (1998) to account for misclassification in a standard binary choice model. Hackney and Friesner (2015) first applied this model to chapter choice in a single bankruptcy district. Here, instead of α_0^d (α_1^d) representing the probability of a false positive (negative), it reflects the probability of a filer deviating from the district's preferred chapter choice and filing under Chapter 13 (Chapter 7).[24] The deviation rates are identified by extreme values of the index $x\beta_d$. As $x\beta_d \to -\infty$, $\Pr(c_{id} = 1|x_i, d) \to \alpha_0^d$. As such, α_0^d is identified by the presence of filers whom the district strongly wishes to steer away from Chapter 7 ($x\beta_d << 0$) but are nonetheless observed in Chapter 7. Similarly, α_1^d is identified by the presence of filers whom the district strongly wishes to steer into Chapter 7 ($x\beta_d >> 0$) but are nonetheless observed in Chapter 13. Identification requires that the total deviation rate is not too high; specifically, $\alpha_0^d + \alpha_1^d < 1$ (Hausman *et al.*, 1998).

4.2 Decomposing Geographic Variation

Upon estimation of the district-specific models, our goal is to use the results to understand the geographic variation in Chapter 7 rates across districts. Extending the Blinder-Oaxaca decomposition for binary choice models in Fairlie (2005) to our setup, we can decompose the difference in Chapter 7 rates across every pair of districts, d and d', into three components: the distribution of filer covariates x_i, the district-specific coefficients β_d, and the deviation probabilities, α_0^d and α_1^d. However, given the large number of districts in our sample, a complete set of pairwise comparisons is unwieldy. Instead, we estimate a pooled, national model and compare each district to the nation as a whole. The national model, which depends on α_0^N, α_1^N, and β_N, is estimated using a single model on the pooled sample of observations from all districts. The estimates of β_N convey information about the "average" sorting preferences of filers and the estimates of α_0^N and α_1^N convey information about the "average" deviation rates.

Comparison to the National Model

To decompose the difference in Chapter 7 rates between district d and the national average N, denote the observed and predicted Chapter 7 shares for district d as $\bar{P}_d^7 = \frac{1}{N_d}\sum_{i=1}^{N_d} c_{id}$ and $\tilde{P}_d^7 = \frac{1}{N_d}\sum_{i=1}^{N_d} \hat{c}_{id}$, respectively, where

$$\hat{c}_{id} \equiv \hat{\alpha}_0^d + \left(1 - \hat{\alpha}_0^d - \hat{\alpha}_1^d\right) \Phi\left(x_i \hat{\beta}_d\right) \tag{5}$$

[24] Palangkaraya *et al.* (2011) estimate a similar model with patent approvals, and interpret α_0 (α_1) as the probability of an incorrectly approved (denied) patent application.

and N_d is the number of filers in district d. Because the sample mean of the predicted probabilities from a probit model may differ slightly from the sample mean of the binary outcome, we define $\delta_d^7 \equiv \bar{P}_d^7 - \tilde{P}_d^7$ as the residual gap.

The gap in Chapter 7 rates between a given district, d, and the nation as a whole, N, is

$$\Delta_d^T \equiv \bar{P}_d^7 - \bar{P}_N^7,$$

where $\bar{P}_N^7$ is the Chapter 7 share in the pooled national data (which is 76%). This gap can be decomposed into four terms

$$\begin{aligned}
\Delta_d^T = \quad & \underbrace{\hat{\tilde{\alpha}}_1^N \left\{ \frac{1}{N_d} \sum_{i=1}^{N_d} \Phi(x_{id}\hat{\beta}_N) - \frac{1}{N_N} \sum_{i=1}^{N_N} \Phi(x_{iN}\hat{\beta}_N) \right\}}_{\text{Covariate Gap}} \\
& + \underbrace{\hat{\tilde{\alpha}}_1^N \left\{ \frac{1}{N_d} \sum_{i=1}^{N_d} \Phi(x_{id}\hat{\beta}_d) - \frac{1}{N_d} \sum_{i=1}^{N_d} \Phi(x_{id}\hat{\beta}_N) \right\}}_{\text{Coefficient Gap}} \\
& + \underbrace{\left(\hat{\alpha}_0^d - \hat{\alpha}_0^N\right) + \left(\hat{\tilde{\alpha}}_1^d - \hat{\tilde{\alpha}}_1^N\right) \frac{1}{N_d} \sum_{i=1}^{N_d} \Phi(x_{id}\hat{\beta}_d)}_{\text{Deviation Gap}} + \underbrace{(\delta_d^7 - \delta_N^7)}_{\text{Residual Gap}}
\end{aligned} \tag{6}$$

where x_{id} for $i = 1, \ldots, N_d$ and x_{iN} for $i = 1, \ldots, N_N$ are the covariates for the filers in district d and in the pooled national sample, respectively, and N_N is the total number of filers in the pooled sample.

These decomposition terms represent the portion of the gap in Chapter 7 rates due to the differences in each component. The Covariate Gap reflects the gap due to differences in the distributions of filer covariates between district d and the national sample, evaluated at the deviation rates and coefficients from the national model. The Coefficient Gap reflects the gap due to differences in legal culture as captured by the coefficients, evaluated at the distribution of filer characteristics in district d and the national deviation rates. The Deviation Gap reflects the gap due to differences in deviation rates, evaluated at the distribution of filer covariates and the coefficients for district d. The Residual Gap, which in practice is negligible, captures any residual difference between the sample means and the mean predicted probabilities from the probit models.

The Coefficient Gap and Covariate Gap can be further decomposed to isolate the contribution of subgroups of coefficients and covariates (Fairlie, 2005). We examine the role of each of the three legal

barriers separately, as well as subgroups of filer financial characteristics and race.[25] Finally, the Deviation Gap can be further decomposed to isolate the separate contributions of α_0 and α_1. Appendix D contains the exact form of these decompositions, as well as the derivation of Equation (6).

Aggregating the Decomposition Across Districts

After decomposing Δ_d^T following Equation (6) for each district d, we wish to summarize the contribution of each part. However, since the contributions may be positive or negative, aggregation is not straightforward. To proceed, we rewrite the decomposition more compactly as

$$\underbrace{\Delta_d^T}_{\text{Total Gap}} = \underbrace{\Delta_d^C}_{\text{Coefficient Gap}} + \underbrace{\Delta_d^X}_{\text{Covariate Gap}} + \underbrace{\Delta_d^A}_{\text{Deviation Gap}} + \underbrace{\Delta_d^R}_{\text{Residual Gap}} . \tag{7}$$

We then summarize the total variation across all districts that is explained by each component using the deviation ratio (DR). The DR for component $j = C, X, A, R$ is given by

$$DR^j = \frac{\sum_{d=1}^{D} \texttt{sign}\left(\Delta_d^T\right) \cdot \Delta_d^j}{\sum_{d=1}^{D} \left|\Delta_d^T\right|}, \tag{8}$$

where D is the total number of districts. The numerator in Equation (8) multiplies each district's component gap, Δ_d^j, by the sign of the total gap for that district, Δ_d^T. Thus, the deviation ratio for component j will be positive if the aggregate component j gap and the aggregate total gap are of the same sign. In this case, component j helps explain the total gap; equivalently, eliminating component j differences would reduce the gap. The deviation ratio for component j will be negative if the aggregate component j gap and the aggregate total gap are oppositely signed. In this case, component j helps reduce the total gap; equivalently, elimination of component j differences would increase the gap. For example, if $DR^C = -0.05$, it would indicate that the aggregate total gap, $\sum_{d=1}^{D} \left|\Delta_d^T\right|$, in chapter choice would increase by 5% if all districts had the same coefficients β. Equivalently, heterogeneity in the coefficients reduces geographic variation in chapter choice. Note, the four DR^j terms must sum to one, thereby fully accounting for the geographic variation in filing rates across districts.[26]

[25] With these decompositions into covariate groups, the order of the decomposition matters. We address this by conducting a separate decomposition for each possible permutation of the covariate groups, then report the average across all permutations.

[26] This is because $|\Delta_d^T| = \texttt{sign}(\Delta_d^T) \times \Delta_d^T = \texttt{sign}(\Delta_d^T)\left[\Delta_d^C + \Delta_d^X + \Delta_d^A + \Delta_d^R\right]$, implying that $\sum_{d=1}^{D} |\Delta_d^T| = \sum_{d=1}^{D} \texttt{sign}(\Delta_d^T)\left[\Delta_d^C + \Delta_d^X + \Delta_d^A + \Delta_d^R\right]$.

5 Results

5.1 Models of Chapter Choice

We begin by reporting results from the national and district-specific models of chapter choice. The results are shown in Table 2. As a benchmark, Columns 1 and 2 report the coefficient estimates and average marginal effects (AMEs) from a standard probit model (without deviations) estimated using the pooled national sample. This model does not allow for heterogeneity across districts, nor for filer deviations. Still, the model fits the data well; the Efron pseudo R^2 is 0.48 and the area under the receiver operator curve (AUC) is 0.91.[27] The signs of several coefficients are consistent with common conceptions about chapter choice. For example, filers with greater disposable income, those with nonexempt home equity, and those with more secured or nondischargeable debt are less likely to enter Chapter 7. However, other coefficients are at odds with standard predictions. In particular, the positive coefficient on homeownership is puzzling, although this reflects the partial effect after controlling for other aspects of homeownership (i.e., secured debt share, negative equity, and nonexempt equity).

Columns 3 and 4 display the results from the national model but now allowing filer deviations. Again, no heterogeneity across districts is allowed. Compared to Column 1, allowing for deviations improves the fit of the model with the Pseudo R^2 increasing to 0.63 and the AUC is 0.93. A likelihood ratio test easily rejects the null that $\alpha_0 = \alpha_1 = 0$ ($p < 0.001$), indicating that the deviation rates are statistically meaningful. The estimated deviation probabilities are $\alpha_0 = 0.15$ and $\alpha_1 = 0.02$. Interpreted in light of our model, this implies that it is much more likely to be the case that a *district* prefers Chapter 13 but the *filer* enters Chapter 7 than the converse.

Allowing for filer deviations also causes most AMEs to increase in magnitude. Notably, the AME for monthly disposable income more than doubles. This occurs for two reasons. First, deviations can rationalize observations with very low index values ($x_i\beta_N << 0$) observed in Chapter 7 through the deviation rates α_0, whereas a standard probit model would fit these observations by reducing the magnitude of the corresponding coefficient in β. Second, the AME reported in Column 4 (and Column 6) represents the AME on the district's probability of preferring Chapter 7, which comes from the inner probit.[28] The marginal effects on actual filing rates, which are obtained by multiplying the AMEs by $(1 - \alpha_0^d - \alpha_1^d)$, are smaller because filers may deviate from the district's preferences.

[27] The AUC can be interpreted as the probability that, given a randomly chosen Chapter 13 and Chapter 7 case, the model will correctly assign a higher probability of Chapter 13 to the actual Chapter 13 case than the actual Chapter 7 case.

[28] Specifically, for covariate j, the AMEs in Columns 2, 4, and 6 are calculated as the average value of $\phi(x_i N\beta)\beta_j$ where $x_i N$ is the national distribution of filers.

Finally, Columns 5 and 6 report estimates from the district-specific probit models allowing for filer deviations. Specifically, we report the 10^{th} and 90^{th} percentiles of the coefficient estimates and AMEs. The main takeaway is that there is significant heterogeneity across districts, and allowing for such heterogeneity improves the fit of the model even further; the Efron Pseudo R^2 increases to 0.70 and the AUC improves to 0.96. A likelihood ratio test rejects the null that the parameters are equal across districts ($p < 0.001$). In terms of the AME estimates on disposable income, the 10^{th} percentile is -0.96 and the 90^{th} percentile is -0.48. As such, while disposable income is an important determinant of the chapter steering mechanism in all districts, the average marginal effect is twice as strong in some districts relative to others. Other coefficient estimates exhibit similar heterogeneity. For example, in some districts being a homeowner *decreases* the probability of a filer being steered into Chapter 7 by three percentage points; in others it *increases* the probability by three percentage points. The heterogeneity in these coefficients indicates that districts sort filers differently, conditional on their characteristics, consistent with a salient role of local legal culture in the chapter choice decisions.

5.2 Decomposing Geographic Variation

We now decompose the geographic variation in Chapter 7 rates into the share explained by differences in covariates, coefficients, and deviation rates. For each district, we use Equation (7) to decompose the difference between the district's Chapter 7 rate and the national average. For example, the Chapter 7 share in the Eastern District of California is 85.8%, which is 9.1 percentage points (pp) above the national average of 76.7%. Using Equation (6), the covariate gap explains 5.6 pp of this difference, the coefficient gap explains 1.4 pp, and the deviation gap explains 2.1 pp. After calculating these decompositions for each district, we use Equation (8) to summarize the share of the total geographic variation explained by each component.[29] Panel A in Figure 2 reports the results. Overall, the covariate gap explains 61% of the aggregate geographic variation, the coefficient gap explains 15%, and the deviation gap explains 24%.[30] Most of the variation is due to differences in individual characteristics, but there is a meaningful role for place-based differences in the local legal culture, as reflected in coefficients, and the deviation rates. Although the magnitudes are not directly comparable, this result is consistent with Keys *et al.* (2020), who find an important role for both individual and place-based factors in bankruptcy filing decisions.

Panel B in Figure 2 reports results from further decomposing the geographic variation into the role of

[29] We show the full set of these district-specific decompositions in Appendix Figure A3.

[30] Appendix Table A1 reports the exact values from these decompositions. The residual gap is omitted from the figure as it explains only 0.09% of the variation.

specific variables, coefficients, and deviation rates. Among the covariates, the most important, by far, is disposable income, which alone explains 54% of the aggregate geographic variation in chapter choice. This indicates a filer's disposable income is the primary determinant of chapter choice, reflecting a major role for the screening mechanisms discussed in Section 2. Importantly, this portion attributed to disposable income does not come from the role that disposable income plays in the formal means test. The formal means test only applies to above-median-income filers, which is captured by the interaction of disposable income with the indicator for above-median income. The interaction is *not* included in the 54% attributed to the uninteracted covariate disposable income. In Appendix Figure A4, we investigate this further by re-estimating the model and conducting the full decomposition analysis on the sample of below-median-income filers. Even in this subgroup, which automatically passes the formal means test, the covariate disposable income explains 49% of the geographic variation in chapter choice.

We find little role for the other legal barriers to chapter choice; the means test and asset exemptions together explain less than 1% of the aggregate variation. While perhaps surprising because the literature focuses only on these two legal barriers, their small effects are consistent with external evidence. For asset exemptions, the small role reflects the fact that less than 5% of filers have nonexempt home equity, which is the one nonexempt asset measured accurately in our data. That said, prior analyses with more detailed information on all nonexempt assets find that only 6% of Chapter 7 filers have nonexempt assets and the nonexempt assets that filers do have tend to be cash in quantities too small to induce differences due to geographic variation in exemptions (Jiménez, 2009; Pattison and Hynes, 2020; Hynes and Pattison, 2022). Even among Chapter 13 filers, discussions with attorneys (Braucher, 1993) and empirical evidence from Morrison and Uettwiller (2017) indicate that most Chapter 13 cases would be no-asset cases in Chapter 7.[31] For the means test, the small role is unsurprising (and comforting) given that geographic variation in chapter choice predates the introduction of the means test in 2005. The small role is consistent with Gross *et al.* (2021) who find little change in the income distribution of bankruptcy filers after the introduction of the means test. This is consistent with the means test not binding for most filers. Among Chapter 13 filers, Kiel and Fresques (2017) find that only 9% would have created a presumption of abuse under the means test. Even for above-median income filers who fail the means test, creating a presumption of abuse, many are able to rebut the presumption and still file under Chapter 7.[32]

[31]The FJC data contain a variable marked "asset case," and 99% of Chapter 13 filers do mark that their case as an "asset case." This variable indicates that Chapter 13 filers will distribute funds to unsecured creditors (as is required by most trustees), but it does not indicate that these funds are available because the filer has nonexempt assets.

[32]In fiscal year 2012, approximately 13% of Chapter 7 filers had income above their state's median income. Of the cases, only 6% were presumed abusive under the means test. And, after considering a debtor's special circumstances, statutory discretion was exercised and a dismissal was not sought in about 60% of the cases presumed to be abusive (USTP, 2012).

Other filer characteristics, apart from the legal barriers, play a relatively minor role as well, combining to explain only 7% of the aggregate geographic variation. Separating these financial and race covariates further in Appendix Figure A5 reveals that race plays the most important role within this subset, explaining 5% of the aggregate variation. The filer's financial characteristics explain less than 2% of the total variation. This suggests that the financial incentives to file, as determined by homeownership and share of secured debt, explain little of the aggregate geographic variation in chapter choice. While we are perhaps missing some factors that affect chapter choice—such as whether the filer has delinquent secured debt—the pseudo-R^2 and AUC in Table 2 suggest that unobserved attributes explain little of the variation in chapter choice.

The coefficient gap, which explains 15% of the geographic variation, reflects the role of local legal culture and implies that observationally identical filers are sorted differently across districts. Again, the coefficient on disposable income plays the largest role, followed closely by the district-specific constant. Combined, heterogeneity in these two coefficients explain 33% of the aggregate geographic variation in chapter choice, but heterogeneity in the remaining coefficients offset this by reducing aggregate variation by accounting for -18% of the variation. If heterogeneity in these other coefficients were eliminated, then geographic variation in chapter choice would increase. Within these other coefficients, the coefficients on the financial characteristics explain nearly all of the variation, while the coefficients on the means test, exemption, and race variables explain virtually none (see Appendix Figure A5). Importantly, our results are consistent with racial steering being similar across districts despite differences in the covariate race explaining 5% of the aggregate geographic variation in chapter choice.

Finally, heterogeneity in the deviation rates, α_0 and α_1, explains 24% of the aggregate geographic variation, with more than two-thirds of this due to α_0. Specifically, 17% of the aggregate variation is due to differences in the α_0, which is the frequency of debtors whom the district views as suited for Chapter 13 actually filing for Chapter 7. These deviation rates can also be viewed as a component of local legal culture in that they reflect, at least in part, how strictly a district enforces its preferences. Districts with low deviations strictly enforce their preferences, while districts with high deviations frequently allow debtors to decide.

5.3 The Role of Disposable Income in District Heterogeneity

Given the central role of disposable income in explaining geographic variation in chapter choice, this section delves deeper into differences surrounding this variable. As discussed in Section 2, there are two reasons why disposable income plays such an important role in chapter choice. Chapter 7 filers with

high disposable income risk having their case dismissed for abuse under the totality of circumstances. Conversely, Chapter 13 filers must have sufficient disposable income to fund the Chapter 13 plan. As a result, typically low (high) disposable income filers are sorted into Chapter 7 (Chapter 13). The fact that the covariate disposable income explains 54% of the total geographic variation (using the coefficients from the national model) indicates that, even without any geographic variation in sorting, differences in filers' disposable income explains most of the geographic variation.

However, districts also differ in how they sort filers *conditional* on disposable income. Heterogeneity in the coefficient on disposable income and the constants are the most important sources of variation among the coefficients. In addition, given the importance of screening on disposable income, heterogeneity in the deviation rate α_0 primarily reflects the frequency with which districts allow filers with high disposable income into Chapter 7. Here, we further investigate the sources of these differences across districts in the treatment of disposable income across districts. We also examine the degree to which misreporting of disposable income may impact our analysis.

5.3.1 Coefficients: Heterogeneous Thresholds for Disposable Income

Heterogeneity in the coefficients on disposable income and the constant imply that districts have different thresholds for what is considered "high" disposable income. Filers with income below this threshold are steered into Chapter 7, while filers with disposable income above this threshold are steered into Chapter 13. Using the model estimates, we compute each district's implicit threshold. To do so, recall from Section 4 that the index value, $x_i\beta_d$, represents the view of district d on the suitability of filer i for Chapter 7 (relative to Chapter 13). As such, the district is indifferent between the two chapters for filers with $x_i\beta_d = 0$. Thus, for each filer i in district d, we can hold characteristics other than disposable income fixed at $x_{i,-DI}$ fixed and solve for value of disposable income where $x_i\widehat{\beta}_d = 0$.

To summarize the heterogeneous treatment of disposable income across districts, we calculate the implied district-specific "average" income threshold for a representative filer with characteristics other than disposable income set at the national average, $\bar{X}_{-DI,N}$ and all coefficients other than the constant and the coefficient on disposable income set at the values obtained from the national pooled model, $\widehat{\beta}_{-DI,N}$. This shuts down the role of heterogeneity in other characteristics and coefficients, but the results above suggest these have little effect in steering. Therefore, each district's implied disposable income threshold

(for the average filer), denoted DI_d^*, satisfies the following equation

$$\widehat{\beta}_{0,d} + \widehat{\beta}_{DI,d} DI_d^* + \bar{X}_{-DI,N} \widehat{\beta}_{-DI,N} = 0.$$

The resulting value, DI_d^*, corresponds to the level of disposable income where the district is indifferent between chapters; the district prefers filers with disposable income above (below) this value in Chapter 13 (Chapter 7).

Across districts, the estimated thresholds, DI_d^*, vary from less than \$50 to more than \$2,000 in monthly disposable income, with a median of \$200. Panel (a) in Figure 3 shows these district-specific thresholds DI_d^* are strongly correlated with districts' Chapter 7 rates. Consistent with our interpretation, districts with low Chapter 7 rates have low thresholds, indicating tighter screening of who has access to Chapter 7. Conversely, districts with high Chapter 7 rates have high thresholds. In summary, heterogeneity in $\beta_{0,d}$ and $\beta_{DI,d}$ implies that districts have strikingly different views about the levels of disposable income that are suitable for Chapter 7, and these differences are highly correlated with overall chapter choice.

Highlighting the heterogeneity, Panel (b) in Figure 3 shows the share of bankruptcies filed under Chapter 7 across one-hundred-dollar bins of disposable income for districts with different estimated thresholds. In the national sample (labeled "National"), nearly all filers with negative disposable income are in Chapter 7, but this sharply declines to only 13% as disposable income becomes positive. We then group districts into quartiles based on the threshold estimates, and separately plot this line for filers within these quartiles. For filers in a first-quartile district (median threshold of \$83), the share under Chapter 7 drops sharply around \$100, with only 24% of filers with a disposable income of \$150 in Chapter 7. In contrast, for filers in a fourth-quartile district (median threshold of \$349), the share drops much more gradually, with 73% of filers with a disposable income of \$150 in Chapter 7. Thus, the effect of screening on disposable income, as well as heterogeneity in this screening across districts, is easily visible even in this simple plot.

5.3.2 Deviations: Heterogeneous Scrutiny of Disposable Income

Heterogeneity in the deviation rates explains 24% of the aggregate geographic variation. Panel A in Figure 4 shows how the estimates of α_0^d and α_1^d relate to the overall Chapter 7 filing rate of a district. Districts with a high Chapter 7 share tend to have high values of α_0 (deviations into Chapter 7) and low values of α_1 (deviations into Chapter 13). The converse is true for districts with a low Chapter 7 share. Moreover, there is greater heterogeneity in α_0; most values of α_1 tend to be close to zero. Not only is this consistent with the larger role for α_0 in the decomposition (see Figure 2), but it also shows that a large

part of the variation in Chapter 7 shares across districts is due to differences in the propensity or ability of filers to enter Chapter 7 in cases where the district prefers Chapter 13.

With disposable income as the primary screening device, the α_0 deviations reflect the ability of debtors with high disposable income to file Chapter 7. While debtors and their attorneys decide which chapter to file, these cases can be dismissed or converted to the other chapter if they are deemed abusive by the district's trustees and judges (see Section 2). Districts may differ in the frequency of these actions and bankruptcy attorneys, aware of this frequency, may adjust their tendency to allow a filer to deviate from a district's preferred chapter. Thus, we expect a negative relationship between a district's deviation rates and how strictly a district enforces its preferences through dismissals and conversions.

To investigate this, we examine the variation in the share of Chapter 7 cases that are either dismissed or converted across districts. This information is not used when estimating the model, and so provides an external test of one mechanism explaining the deviation rates. To focus on the dismissal of cases that the district views as poorly suited for Chapter 7, we separate dismissal for filers with high disposable income (with $DI_i >$ \$100) and low disposable income (with $DI_i \leq$ \$100). Overall, 4.9% of cases with high disposable income filed under Chapter 7 are dismissed or converted into Chapter 13, while only 1.5% of cases with low disposable income are dismissed or converted.[33] Across districts, the *dismissal rate*, defined as the share of Chapter 7 cases that are dismissed or converted to Chapter 13, varies from 1% to 18% for filers with high disposable income. As seen in Panel B of Figure 4, these dismissal rates are negatively correlated with the estimates of α_0. That is, deviations into Chapter 7 are more common in districts where these cases have a lower probability of being dismissed. For comparison, we also plot the share of dismissals among cases with low disposable income, which is low in all districts and uncorrelated with the estimated deviation rates. We focus on deviations into Chapter 7, α_0, because heterogeneity in α_0 explains nearly 75% of the deviation gap, but we find a similar negative relationship between α_1 deviations and dismissals in Chapter 13 (see Appendix Figure A6).

Highlighting the heterogeneity, Panel C in Figure 4 shows the dismissal rate for Chapter 7 cases across one-hundred-dollar bins of disposable income for districts with different estimated α_0 deviation rates. In the national sample (labeled "National"), dismissals increase sharply once monthly disposable income nears \$100. We then group districts into quartiles based on the estimated α_0 deviation rates, and separately plot the share dismissed for filers within these quartiles. For filers in a first-quartile district (median deviation rate of 6%), the share of dismissals rises sharply once disposable income becomes positive, eventually

[33]Note, even if our model is correctly specified, we would not expect the share of good fits that are dismissed or converted to be zero if the district observes ϵ in the model of relative chapter suitability (see Equation (1)).

exceeding 10%. In contrast, for filers in a fourth-quartile district (median deviation rate of 30%), the share rises much more gradually once disposable income becomes positive and never exceeds 4%. These results demonstrate that the deviation rates reflect the different degrees to which districts scrutinize filings involving high disposable income in Chapter 7. To better understand this, in Appendix E we provide a model in which districts choose the optimal level of scrutiny of filings. This behavior leads to the endogenous determination of the deviation rates. In the model, districts with more filers suited for Chapter 13 have an incentive to more carefully scrutinize Chapter 7 filings. The model can explain one-quarter of the variation in α_0 and one-tenth of the variation in α_1. The remainder of the geographic variation in the dismissal rate may reflect divergent beliefs across districts concerning the frequency in which dismissals or conversions are warranted. Such beliefs constitute another dimension of local legal culture.

5.3.3 Potential Manipulation of Disposable Income

Given the sharp screening based on disposable income, a concern is that debtors or their attorneys may manipulate reported disposable income depending on the chapter they wish to file. For example, a debtor seeking to file under Chapter 7 may report lower disposable income to reduce the chance that a judge will dismiss the case for abuse. Indeed, some attorneys report "tweaking" expenses to reduce the disposable income for debtors filing under Chapter 7.[34] Features of the bankruptcy system limit the extent of such manipulation. First, bankruptcy trustees, who represent the interests of creditors, can request additional evidence to justify reported disposable income. If the debtor cannot support the reported values, the case may be dismissed or converted to Chapter 13. Second, the fact that creditors sometimes use information reported on bankruptcy forms to prove that a debtor committed fraud when initially applying for credit further incentivizes accurate reporting (Elias and Renauer, 2013). Despite these safeguards, the potential for manipulation remains. In this section and Appendix F, we discuss and investigate the sensitivity of our results to these concerns.

Misreporting creates two potential issues for our analysis. First, measurement error in a covariate leads to biased coefficient estimates.[35] As a result, misreporting leads to an inconsistent estimate of the population coefficient on *true* disposable income. However, in our context, this is not actually problematic. In our model, the inner probit model captures the steering of filers *by districts* given the *observed* attributes

[34]See, for example, `https://www.steffenslaw.com/blog/how-to-tweak-bankruptcy-schedule-j.cfm` and `https://www.bankruptcymastery.com/twelve-ways-to-tweak-schedule-j/`. However, others emphasize the importance of accurate reporting, refraining from adjusting amounts to make the case "look better." See, for example, `https://cascadebankruptcy.com/news/schedules-i-and-j-your-income-and-expenses`.

[35]In a binary choice model, classical measurement error—mean zero, homoskedastic, and independent of other model components—leads to greater attenuation bias compared to a linear model (Yatchew and Griliches, 1985).

of filers. Thus, while misreporting will lead to an inconsistent estimate of the population coefficient on true disposable income, that is not the parameter we seek to estimate. Instead, we aim to estimate the district's steering on *reported* disposable income, and our estimate is consistent for this population coefficient. How districts respond to reported disposable income—regardless of whether or not it is accurate—is exactly the behavior we wish to identify.

Second, and more serious for our analysis, misreporting directly affects the values of disposable income observed in the data. As the coefficient estimates and covariate values form the basis of the decomposition analysis, cross-district distributions in disposable income will reflect differences in both actual disposable income and reporting behavior, potentially causing us to overstate the importance of disposable income. Moreover, if heterogeneity in reporting behavior across districts reflects, in part, local legal culture, then our analysis will understate the importance of local legal culture. We investigate this concern using two strategies.

Our first strategy relies on a donut sensitivity analysis based on the idea that manipulation is most likely to occur around the threshold where disposable income affects chapter choice. That is, if a filer's actual disposable income is sufficiently low to qualify Chapter 7, there is no incentive to misreport as doing so increases the likelihood that the trustees raise challenges. As a result, if geographic variation in chapter choice is driven by filers with reported disposable income near the threshold, then one would worry that this variation is due to misreporting (or differences in how districts report disposable income). On the other hand, if geographic variation in chapter choice is driven by filers with reported disposable income far from the threshold, then one should be confident that this variation reflects differences in true disposable income.

To proceed, we omit filers with disposable income in the neighborhood of \$100 per month. We use this threshold since Panel B in Figure 3 shows a precipitous drop in Chapter 7 filings at roughly this value in the national sample. Figure 5 compares each district's overall Chapter 7 rate from the full sample to the Chapter 7 rate calculated excluding filers with reported disposable income within $\$M$ of \$100 (i.e., filers where $|DI_i - 100| \leq M$). We do this separately for $M = \$100, \$250, \$500$. As seen in the figure, the geographic heterogeneity is preserved even when filers in these neighborhoods of the \$100 threshold are omitted, suggesting little role for manipulation around the threshold in explaining the geographic variation in chapter choice. In Appendix F, we take this analysis further by redoing the decomposition analysis on these donut samples with $M = 100, 250, 500$, and find that disposable income explains 63-70% of the

geographic variation within these samples (up from 54% in the full sample).[36]

Our second strategy splits reported disposable income—defined as the gap between reported income and reported expenses—into two parts, DI^{IRS} and DI^{res}, given by

$$\begin{aligned} DI &= \text{Income} - \text{Expenses} \\ &= \underbrace{(\text{Income} - \text{IRS Allowable Expenses})}_{DI^{\text{IRS}}} + \underbrace{(\text{IRS Allowable Expenses} - \text{Expenses})}_{DI^{\text{res}}}, \end{aligned}$$

where DI^{IRS} is reported income less Internal Revenues Service (IRS) allowable expenses and DI^{res} is the difference between IRS allowable expenses and reported expenses. Because reported income can be verified with bank statements and pay stubs, misreporting, to the extent it exists, would likely occur on the expense side. DI^{IRS} replaces self-reported expenses with IRS allowable expenses, which are a function of mortgage payments and allowances based on IRS standards.[37] As such, there is less margin to manipulate DI^{IRS}. DI^{res}, on the other hand, reflects true differences between actual filer expenses and IRS allowable expenses, as well as misreporting of reported expenses.

With disposable income split into two separate covariates, we re-do the decomposition but treat DI^{IRS} and DI^{res} as separate covariates.[38] If the majority of the role played by disposable income in our initial analysis is due to DI^{IRS}, this is suggestive of a small role of misreporting. We report the full decomposition in Appendix F. We find that of the 54% of the aggregate geographic variation in chapter choice explained by the covariate gap attributable to disposable income in the baseline model, DI^{IRS} explains 33%. Thus, the majority of the geographic variation explained by differences in the distribution of reported disposable income found in the baseline model is driven by differences in income and IRS allowable expenses. The remaining variation in disposable income, attributed to differences in residual disposable income, represents the combination of misreported income along with any true expenses that differ from the IRS allowable

[36] We also find similar results, reported in Appendix F, if we replace the continuous measure of disposable income with a binary variable for whether disposable income exceeds $100, which eliminates the possibility of manipulation outside of cases where such manipulation leads to reported and true disposable income lying on opposite sides of the $100 threshold. In the full sample, this binary measure explains 49% of the geographic variation; in the donut samples it explains 60-70% of the variation.

[37] Specifically, we define IRS allowed expenditures as the sum of mortgage/rent expenses and IRS standards for non-mortgage housing expenses, transportation expenses, and non-housing expenses (food, personal care, etc., healthcare). For homeowners, we estimate the housing payments by assuming that the filer financed the total value of the reported real property using a 30-year standard mortgage with a 6% down-payment and a 7% interest rate. For non-homeowners, we use the IRS standard for their county's mortgage/rent payments at the time of the bankruptcy filing. The remaining IRS allowances come directly from the bankruptcy forms and vary across the filer's county or MSA, family size, and time of filing. For family size, we assume single filers have a family size of one and joint filers have a family size of two.

[38] Note, we do not re-estimate the models but instead assign both variables, DI^{IRS} and DI^{res}, the estimated coefficient on disposable income from the baseline model. As discussed above, although disposable income may be mismeasured, our analysis consistently estimates district responses to *reported* disposable income.

values. Overall, both strategies investigating the role of manipulation indicate that the large role for covariate disposable income primarily reflects true differences in disposable income, rather than differences caused by misreporting.

6 Simple Model of Geographic Variation

Our analysis to this point shows that much of the geographic variation in chapter choice can be explained by variation in the distribution of and steering with respect to disposable income, as well as filer deviations from this steering. Focusing on these facets, we develop a parsimonious model of local legal culture in which districts exogenously differ only in their deviation rates and thresholds for disposable income, captured through the coefficient on disposable income and the constant. Our goal is to see how well this simple model explains geographic variation in chapter choice, both in-sample (2010-2014) and out-of-sample (2015-2017), relative to the more complex model that allows for heterogeneity in all coefficients. We then use the simple model to assess the impact of greater uniformity in the treatment of disposable income on the trade-off between debt relief and creditor repayment.

6.1 Evaluating Model Fit

We compare three models of district heterogeneity. The "Full" model makes predictions about chapter choice using the full set of district-specific coefficients $\beta_d^F = [\beta_{0,d}\ \beta_{DI,d}\ \beta_{-DI,d}]$ and deviation rates $\alpha_d^F = \left[\alpha_0^d\ \alpha_1^d\right]$, where $\beta_{0,d}$ and $\beta_{DI,d}$ are the district-specific constant and coefficients, and $\beta_{-DI,d}$ are the district-specific coefficients on the remaining covariates. The "Simple" model allows only for heterogeneity in the district-specific constants, coefficients on disposable income, and deviation rates, so that district steering is determined by the coefficient vector $\beta_d^S = [\beta_{0,d}\ \beta_{DI,d}\ \beta_{-DI,N}]$ and deviation rates $\alpha_d^S = \left[\alpha_0^d\ \alpha_1^d\right]$, where $\beta_{-DI,N}$ are the coefficients on the remaining variables from the national model. The "National" model allows for no district-specific heterogeneity. The coefficient vector is $\beta_d^N = [\beta_{0,N}\ \beta_{DI,N}\ \beta_{-DI,N}]$ and deviation rate vector is $\alpha_d^N = \left[\alpha_0^N\ \alpha_1^N\right]$.

We use these models to predict the average Chapter 7 rate in each district, given by

$$\widehat{P}_d^7(m) = \frac{1}{N_d}\sum_{i=1}^{N_d} \hat{c}_i\left(\widehat{\beta}_d^m, \widehat{\alpha}_d^m\right), \quad m = F, S, N \tag{9}$$

where

$$\hat{c}_i\left(\widehat{\beta}^m, \widehat{\alpha}^m\right) \equiv \widehat{\alpha}_0^m + (1 - \alpha_0^m - \widehat{\alpha}_1^m)\Phi\left(x_i\widehat{\beta}^m\right). \tag{10}$$

To assess fit, we compare the share of the actual district-level variation in Chapter 7 rates that is explained by each model.[39] The Full model explains more than 99% of the *in-sample* geographic variation in chapter choice. The Simple model performs nearly as well, explaining 96% of the variation. The National model explains only 79% of the variation.

We then repeat the exercise, using the estimates obtained from data over the 2010-2014 period to generate predictions over the 2015-2017 period. We obtain similar results. The Full model explains 95% of the *out-of-sample* geographic variation in chapter choice, while the Simple model explains 93% and the National model explains 77%. We report these fit statistics as well as the fit in subsamples of filers with low and high disposable income in Appendix Table A3.

This exercise shows that the simple model captures much of the geographic variation and performs significantly better than a national model with no heterogeneity. Illustrating the fit of the simple model, Figure 6 plots the actual Chapter 7 rates in each district against those predicted by the simple model, $\widehat{P}_d^7(S)$, both in-sample (Panel A) and out-of-sample (Panel B). In both cases, most points lie very close to the 45°-line, indicating that the simple model accurately captures much of the geographic variation.

6.2 Impact of Increased Uniformity

Concern about geographic disparities in the treatment of filers has led to calls for increased uniformity in the bankruptcy system (American Bankruptcy Institute, 2019). Our results inform this discussion in two ways. First, our results identify specific sources of heterogeneity on which to focus, namely those surrounding the treatment of disposable income. Second, the model provides a framework to assess the impact of reducing these differences. For our final analysis, we assess the effects of increased uniformity in the treatment of disposable income on bankruptcy's two competing goals of debt relief and creditor repayment.

To proceed, we examine the changes in sorting that would occur if all districts adopted the preferences of district d^* governing the threshold for disposable income $(\beta_{0,d^*}, \beta_{DI,d^*})$ and deviation rates $(\alpha_0^{d^*}, \alpha_1^{d^*})$. Let $\beta_d^{d^*} = [\beta_{0,d^*}\ \beta_{DI,d^*}\ \beta_{-DI,d}]$ be the mixed coefficient vector where district d adopts the constant and coefficient on disposable income from district d^* and $\alpha^{d^*} = \left[\alpha_0^{d^*}\ \alpha_1^{d^*}\right]$. Finally, define $c_{id}^{d^*} = \hat{c}_i\left(\widehat{\beta}_d^{d^*}, \widehat{\alpha}^{d^*}\right)$, with $\hat{c}_i(\cdot)$ given in Equation (10).

[39] Specifically, fit is measured as $1 - RSS(m)/TSS(m)$, where $RSS(m) = \sum_d (P_d^7 - \widehat{P}_d^7(m))^2$ is the sum of squared residuals, $TSS(m) = \sum_d (P_d^7 - \bar{P}_d^7(m))^2$ is the total sum of squares, P_d^7 is the actual Chapter 7 share in district d, $\widehat{P}_d^7(m)$ is the predicted Chapter 7 share in district d according to model m, and $\bar{P}_d^7$ is the average Chapter 7 share observed across all districts. Because the predicted Chapter 7 shares, $\widehat{P}_d^7$, are not fitted values from a simple regression, this is not identical to a regression R^2, although it would be the R^2 from a simple regression of P_d^7 on $\widehat{P}_d^7(m)$ where the intercept (coefficient) is restricted to zero (one).

To summarize the effects of greater uniformity is district sorting, we report the (national) expected Chapter 7 share, discharge amount, and recovery amount predicted by the model given by

$$\begin{aligned}
\widehat{P}_7^{d^*} &= \frac{1}{N}\sum_d \sum_{i\in d} c_{id}^{d^*} \\
D^{d^*} &= \frac{1}{N}\sum_d \sum_{i\in d} D_i^7 c_{id}^{d^*} + D_i^{13}\left[1 - c_{id}^{d^*}\right] \\
R^{d^*} &= \frac{1}{N}\sum_d \sum_{i\in d} R_i^7 c_{id}^{d^*} + R_i^{13}\left[1 - c_{id}^{d^*}\right]
\end{aligned}$$

where d indexes districts, $i \in d$ indexes filers within district d, N is the total number of filers, and D_i^c and R_i^c are the amounts discharged (forgiven) and repaid by consumer i under Chapter $c = 7, 13$, respectively. Construction of D_i^c and R_i^c are not straightforward since these depend on filer i's counterfactual discharge and repayment amounts *if a discharge is achieved* under *each chapter*. We use the fact that Chapter 7 filers pay nonexempt assets and Chapter 13 filers repay all of their disposable income during a three-year or five-year repayment plan. Calculating these amounts is complicated and we detail our approach in Appendix G. Here, we note that our calculations, while capturing the salient features of the bankruptcy system, are necessarily approximations. However, as our goal is to compare D^{d^*} and R^{d^*} across different preferences, our analysis will identify these effects under the assumption that all districts compute discharge and repayments in the same manner.

The results are presented in Figure 7, where Panel A plots (national) expected discharge amount per case against the (national) expected Chapter 7 share if all districts acted as district $d^* = 1, ..., D$, where D is the total number of districts. In other words, we make districts uniform by setting each district's constant, coefficient on disposable income, and deviation rates equal to those from district d^*. The gray circles depict the results. Panel B is identical except (national) expected repayment amount is on the vertical axis.

In each panel, the green circle labeled "Status Quo" indicates the aggregate expected discharge and repayment per case with each district following its own sorting preferences and deviation rates, $(\beta_d, \alpha_0^d, \alpha_1^d)$. In this case, with no uniformity, the national Chapter 7 share is predicted by the model to be 78% with an expected discharge (repayment) per case of \$46,600 (\$5,300). The red circle in each panel labeled "National" indicates the aggregate expected discharge and repayment per case if all districts follow the sorting preferences and deviation rates from national model, $(\beta_N, \alpha_0^N, \alpha_1^N)$. Here, the national Chapter 7 is predicted to be 75% with an expected discharge (repayment) per case of \$46,300 (\$5,600). Thus, on

average, district heterogeneity marginally favors debtors.

Examining uniformity where all remaining districts behave according to district d^*, we find a wide range of outcomes. On the one hand, if all districts held the sorting preferences and deviation rates of the district that *most* favors Chapter 13, the Chapter 7 share would decline to 35%, while the expected discharge (repayment) per case would be \$43,300 (\$8,600). Alternatively, if all districts held the sorting preferences and deviation rates of the district that *least* favors Chapter 13, the Chapter 7 share would increase to 96%, while the expected discharge (repayment) per case would be \$50,200 (\$1,700). The range of combinations in Figure 7 can be thought of as a production possibilities frontier (PPF) for bankruptcy outcomes (given the range of currently observed behaviors) according to our simple model. Varying the practices surrounding disposable income can alter the average amount discharged and recovered in bankruptcy by around $\pm\$3,000$ relative to the status quo. In practice, the actual PPF may diverge from our estimates if the decision by debtors to file bankruptcy at all—taken as exogenous in our model—is affected by changes in the sorting behavior of districts.

7 Conclusion

Where you grow up or live matters for a host of vital outcomes. The bankruptcy system is no different. Within the bankruptcy system, there are persistent geographic differences in the relative use of Chapter 7 and Chapter 13 bankruptcy, leading to geographic differences in the balance between debt relief and creditor repayment. Decomposing this geographic variation into three components, we find that geographic differences in filer characteristics are the most important, explaining 61% of the variation. The remaining variation is explained by differences in how courts steer filers (15%), which we refer to as local legal culture, and filers' ability to deviate from this court steering (24%). Examining these differences in more detail, we find that nearly all of the variation in chapter choice can be explained by a single variable: filer's disposable income. Consistent with this, we show that a parsimonious model, in which districts exogenously differ only in filer characteristics and two parameters governing the treatment of disposable income, successfully explains the geographic variation in chapter choice, both in the estimate sample and in out-of-sample predictions.

Our analysis uncovers several new and important features of the US bankruptcy system. First, filer characteristics explain most of the variation in chapter choice, with a smaller role for local legal culture. An important caveat is that our analysis explains the variation in chapter choice *conditional on filing for bankruptcy*. We do not explain what causes the differences in the characteristics of filers, and it could

be that legal culture plays an important role in the types of debtors that choose to file for bankruptcy. Second, disposable income plays a crucial, and overlooked, gatekeeping role in bankruptcy. Across all districts, filers with high disposable income enter Chapter 13, while filers with low disposable income enter Chapter 7. We discuss the legal mechanisms that lead to this screening and provide additional evidence of its importance. These results show that rather than choosing between Chapter 7 and Chapter 13, chapter choice is frequently dictated by a filer's disposable income. As a result, access to the more debtor-friendly Chapter 7 bankruptcy is screened more tightly than the prevailing view in the academic literature.

Third, despite the importance of disposable income as a screening device by districts, modeling filer deviations from district sorting is important. In particular, districts with a higher share of Chapter 7 cases dismissed or converted have a lower deviation rate into Chapter 7 and vice versa. Variation in the deviation rate into Chapter 7 is an important component of geographic variation in chapter choice.

Finally, our analysis offers two important insights into the implications of greater uniformity in the US bankruptcy system. Most importantly, there is no single way to make the system more uniform. Across the districts, there is large variation in the implied trade-off between the twin goals of the bankruptcy system: debt relief and repayment to creditors. Using a single district as a model for all other districts will lead to widely different national outcomes depending on the district being emulated. Having all districts emulate the implied "average" behavior across districts will lead to less variation across districts, but will not generate large changes in the national share of Chapter 7 cases or the average discharge and repayment per case. Also noteworthy is the fact that while most differences across districts lead to greater heterogeneity in Chapter 7 shares, some differences reduce the heterogeneity. This means that if only some differences across districts are eliminated, the variation in Chapter 7 shares could actually increase.

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Table 1: Summary Statistics

	Chapter 7		Chapter 13		
	mean	std. dev.	mean	std. dev.	difference
	(1)	(2)	(3)	(4)	(5)
Legal Barriers					
monthly disposable inc. ($1,000s)	-0.3	0.6	0.5	0.6	-0.8
above median inc. (%)	26.8	44.3	49.2	50.0	-22.4
disp. income above-median	0.2	0.7	0.8	1.2	-0.6
nonexempt home equity ($1,000s)	0.8	6.2	3.3	12.5	-2.5
non-real assets ($1,000s)	24.1	36.6	34.9	48.3	-10.7
Financial & Race					
assets to income	3.0	3.8	3.3	3.0	-0.3
debt to income	5.3	5.5	4.3	3.6	1.0
homeowner (%)	48.7	50.0	71.3	45.2	-22.5
negative equity ($1,000s)	23.1	51.5	36.7	63.7	-13.6
secured debt share (%)	40.5	36.2	62.7	31.3	-22.2
share nondischargeable (%)	5.7	15.6	6.5	16.3	-0.8
joint filing (%)	29.8	45.7	34.8	47.6	-5.0
zip percent Black (%)	13.0	19.8	22.6	26.3	-9.6
Observations	2,984,246		904,089		

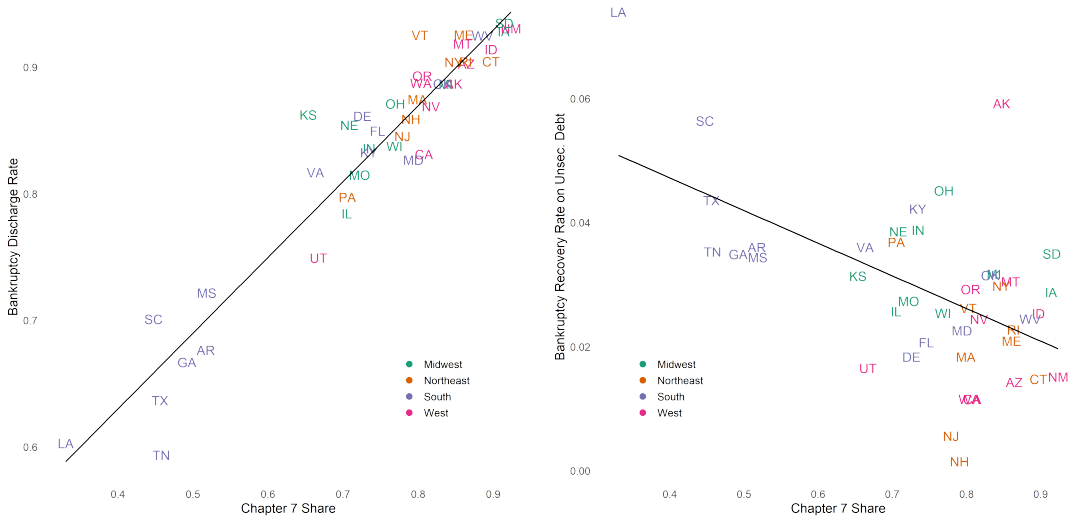
Notes: Summary statistics for the consumer bankruptcy cases in the analysis sample. Column 5 reports the difference in means.

Table 2: Determinants of Chapter Choice

	National Model				District Models	
	No Deviations		With Deviations		With Deviations	
	Coef.	AME	Coef.	AME	$10^{th}, 90^{th}$ Coef.	$10^{th}, 90^{th}$ AME
	(1)	(2)	(3)	(4)	(5)	(6)
monthly disposable inc.	-1.7***	-0.33***	-17***	-0.77***	[-31, -5.9]	[-0.96, -0.48]
(thousands)	(0.0022)	(<0.001)	(0.053)	(0.0011)		
above median inc.	-0.11***	-0.021***	0.098***	0.0044***	[-0.46, 0.72]	[-0.03, 0.03]
	(0.0024)	(<0.001)	(0.0066)	(<0.001)		
disp. income above-median	-0.05***	-0.0097***	-0.011**	-0.00048**	[-0.16, 0.29]	[-0.01, 0.01]
	(0.0014)	(<0.001)	(0.0044)	(<0.001)		
nonexempt home equity	-16***	-3***	-12***	-0.52***	[-39, 2.3]	[-2.4, 0.06]
(millions)	(0.11)	(0.022)	(0.32)	(0.014)		
non-real assets	0.1***	0.02***	3.1***	0.14***	[-2.2, 10]	[-0.12, 0.47]
(millions)	(0.027)	(0.0052)	(0.081)	(0.0036)		
assets to income	-0.049***	-0.0096***	-0.14***	-0.0062***	[-0.25, -0.05]	[-0.01, 0]
	(<0.001)	(<0.001)	(0.0019)	(<0.001)		
debt to income	0.039***	0.0076***	0.1***	0.0046***	[0.01, 0.18]	[0, 0.01]
	(<0.001)	(<0.001)	(0.0014)	(<0.001)		
homeowner	0.23***	0.045***	0.31***	0.014***	[-0.61, 0.7]	[-0.03, 0.03]
	(0.0031)	(<0.001)	(0.0083)	(<0.001)		
negative equity	-1.3***	-0.24***	-4.4***	-0.2***	[-6, 3.1]	[-0.33, 0.16]
(millions)	(0.021)	(0.0042)	(0.063)	(0.0028)		
secured debt share	-1.1***	-0.22***	-0.85***	-0.038***	[-2, -0.1]	[-0.13, 0]
	(0.0043)	(<0.001)	(0.011)	(<0.001)		
share nondischargeable	-0.66***	-0.13***	-0.52***	-0.024***	[-2, -0.08]	[-0.14, 0]
	(0.0056)	(0.0011)	(0.015)	(<0.001)		
joint filing	0.039***	0.0076***	0.28***	0.013***	[0, 0.66]	[0, 0.03]
	(0.002)	(<0.001)	(0.0058)	(<0.001)		
zip percent Black	-0.011***	-0.0021***	-0.015***	-0.00066***	[-0.03, 0]	[0, 0]
	(<0.001)	(<0.001)	(<0.001)	(<0.001)		
Constant	1.6***		2.9***		[2.2, 4.2]	
	(0.0023)		(0.0076)			
α_0	0		0.15***		[0.05, 0.32]	
α_1	0		0.02***		[0.01, 0.05]	
log $\mathscr{L}$	-1291456.9		-906514.4		-752533.4	
Pseudo R^2	0.48		0.633		0.698	
AUC	0.91		0.93		0.96	

Notes: The table report the parameter estimates and average marginal effects (AME) from three chapter choice models: a national probit model (columns 1-2), a national probit model with deviations (columns 3-4), and district-specific models with deviations. The district-specific models report the $10^{\texttt{th}}$ and $90^{\texttt{th}}$ percentiles of the estimates and AMEs across districts. Standard errors in parentheses. Column headers indicate model specification. AUC = area under the receiver operator curve. α_0 and α_1 are the probability of a deviation away from Chapter 7 and Chapter 13, respectively. For the models with misclassification, the reported AME is the average marginal effect of the inner probit, i.e. the average value of $\phi(X\beta)\beta_j$. Efron's Pseudo $R^2 = 1 - \sum_i \frac{c_i - \hat{\pi}_i}{c_i - \bar{c}}$, where c_i is the indicator for debtor i filing under Chapter 13 and $\hat{\pi}_i$ is the fitted value for debtor i. In Column 6, the AMEs are evaluated using the national distribution of the covariates, but use the district-specific coefficient estimates. * p < 0.10, ** p< 0.05, *** p< 0.01.

Figure 1: Discharge and Repayment by Chapter 7 Share

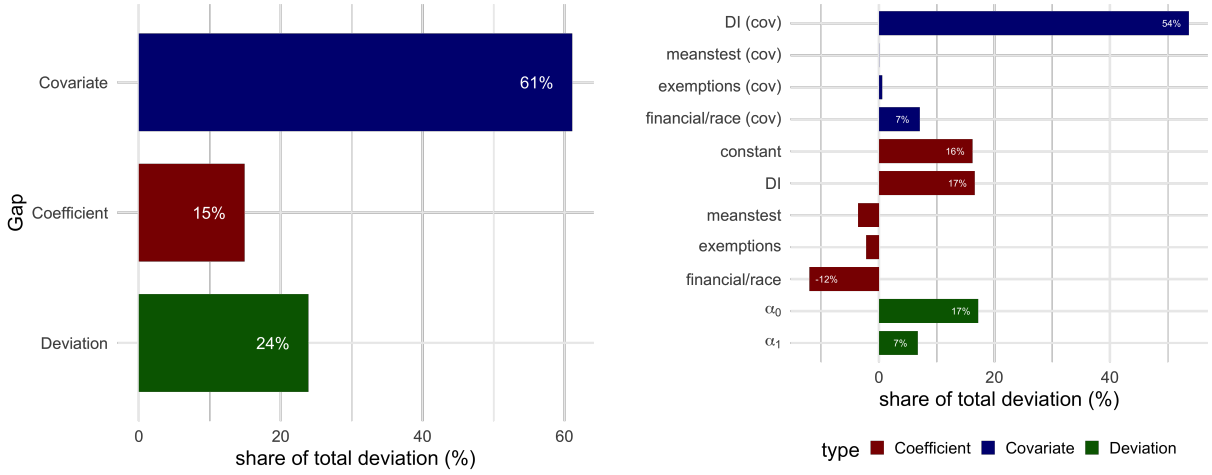


(a) Discharge Rate

(b) Recovery Rate

Notes: The discharge rate is the share of bankruptcy filings that obtained a discharge. The recovery rate is the share of unsecured debt returned to creditors, calculated as the total amount returned by trustees to general unsecured creditors in 2010-2014 divided by the total non-priority unsecured debt of those filing in 2010-2014. Data on discharge rates and total non-priority unsecured credit are from the Federal Judicial Center's Integrated Database. Data on the amount returned are from Trustee Final Reports, which detail actual payments to creditors.

Figure 2: Decomposition of Total Geographic Variation

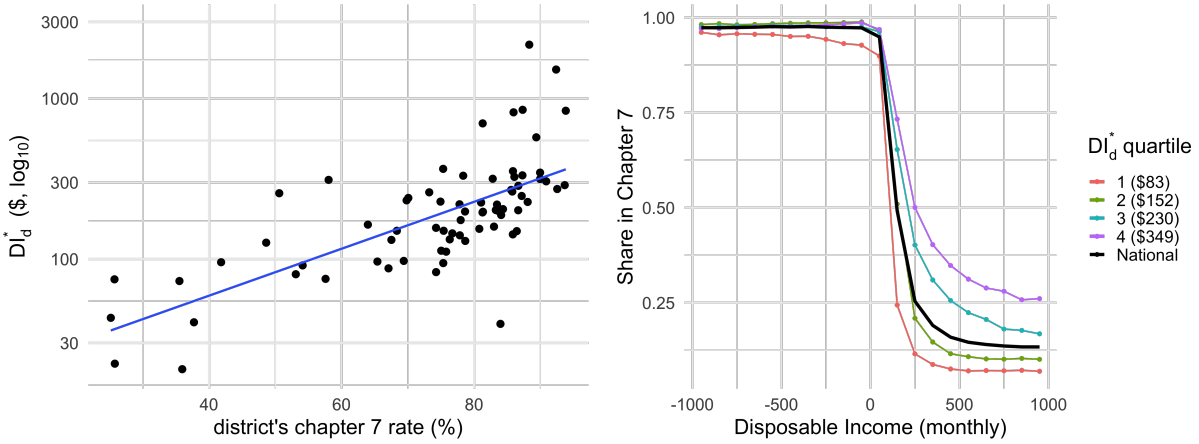


(a) Aggregate Decomposition

(b) Decomposition by Variable Groups

Notes: Figure (a) reports the aggregate decomposition according to equation (8). It omits the residual component, which explains -0.07%. Figure (b) reports the subdecomposition with coefficients and covariates grouped into the three legal barriers and other factors. It also separates the Deviation component into α_0 and α_1.

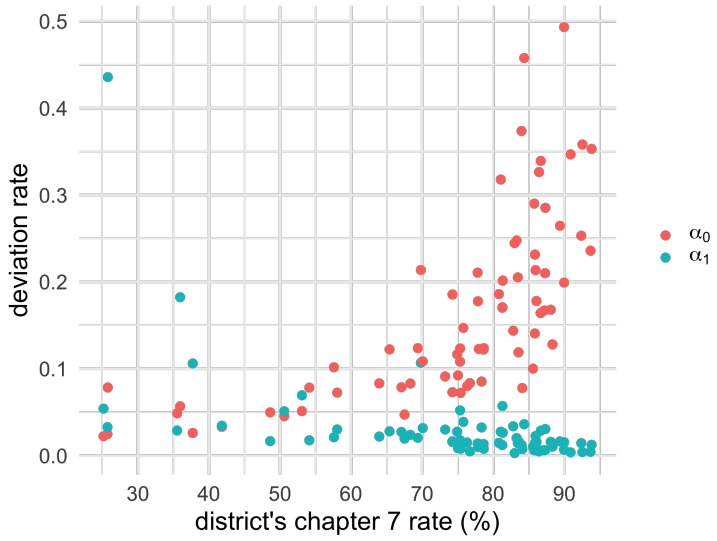
Figure 3: Heterogeneous Thresholds for Disposable Income



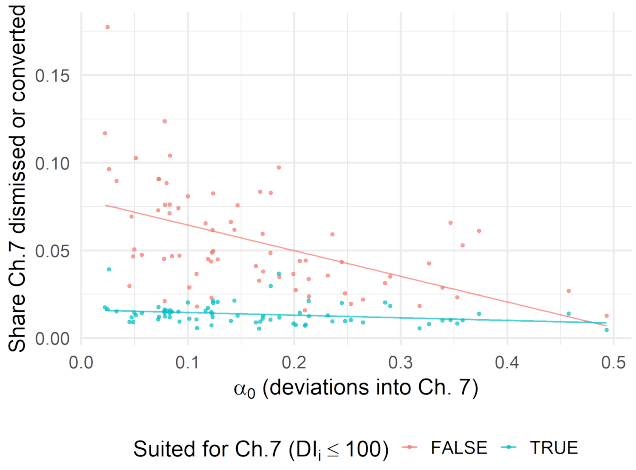
(a) Ch.7 rate and DI_d^* (b) Chapter Choice by Threshold Quartiles

Figure (a) plots DI_d^*, which is the level of disposable income needed to make district d indifferent between placing a filer with average characteristics in Chapter 7 or Chapter 13, against each district's Chapter 7 rate. Figure (b) groups districts into quartiles of DI_d^*, and within each quartile shows the mean Chapter 7 rate of filers grouped by disposable income into one-hundred-dollar bins. In the legend, the median threshold DI_d^* for districts in each quartile is reported in parentheses. The black line, labelled "National," shows the mean Chapter 7 rate from the national sample.

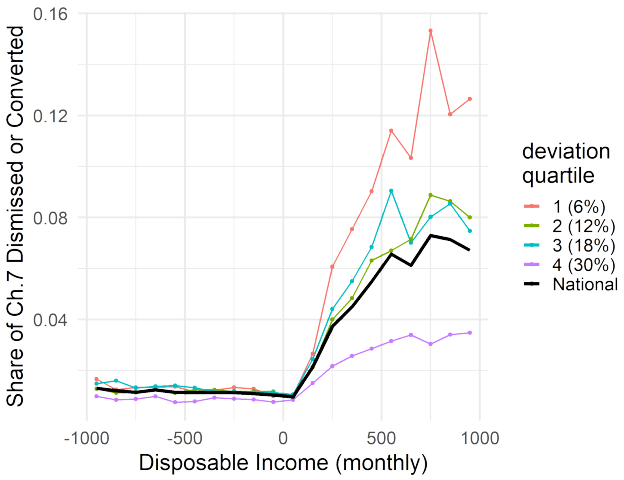
Figure 4: Heterogeneous Deviations and Dismissal Rates



(a) Ch.7 rate and Deviations



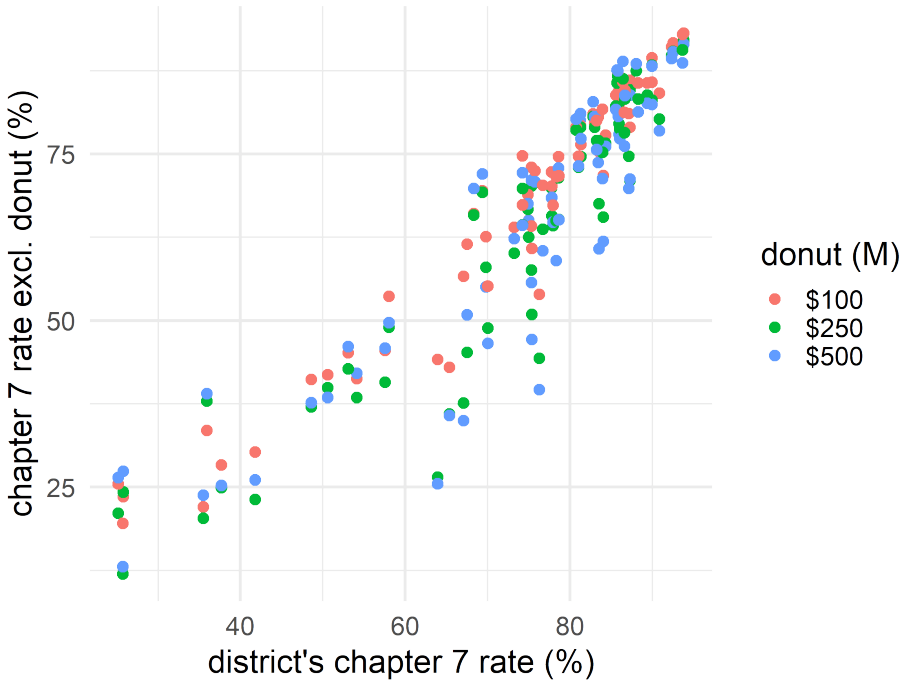
(b) Ch.7 Dismissal/Conversion Rate and α_0



(c) Ch.7 Dismissal/Conversion Rate by α_0 Quartiles

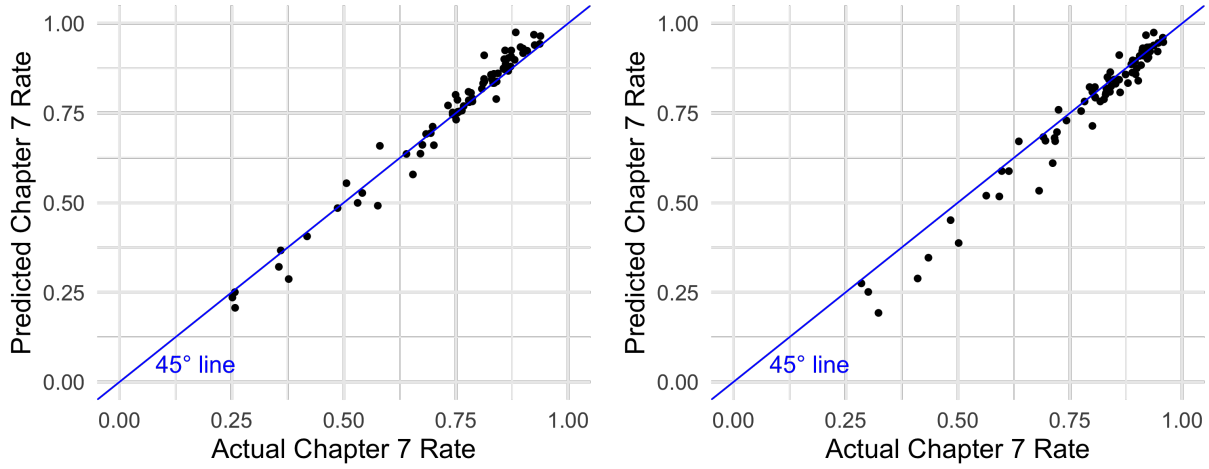
Figure (a) plots each district's estimates of α_0^d, α_1^d against its Chapter 7 filing rate. Figure (b) plots the share of Chapter 7 cases that are dismissed or converted into Chapter 13 against each district's α_0 estimate, with dismissal rates reported separately for Chapter 7filers with disposable income above or below \$100. Figure (c) groups districts into quartiles of α_0, and within each quartile shows the mean dismissal/conversion rate of Chapter 7 filers grouped by disposable income into one-hundred-dollar bins. In the legend, the median deviation rate α_0 for districts in each quartile is reported in parentheses. The black line, labelled "National," shows the mean Chapter 7 dismissal/conversion rate from the national sample.

Figure 5: Sensitivity of Geographic Heterogeneity to Sample



This figure plots each district's share of bankruptcies under Chapter 7 (Chapter 7 rate) in the full sample against the share of bankruptcies under Chapter 7 in the subsample of filers with monthly disposable income far from the \$100 threshold, i.e., we exclude filers iwth $|DI_i - 100| \leq M$ for $M = \$100, \$250, \$500$.

Figure 6: Evaluating Fit of Simple Model

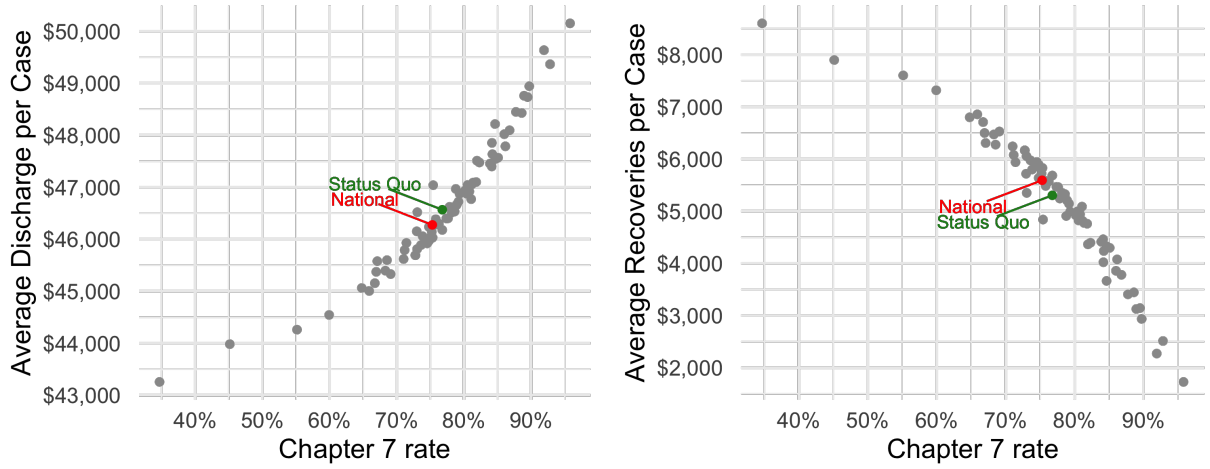


(a) In-Sample Fit: 2010-2014

(b) Out-of-Sample Fit: 2015-2017

This figure plots districts' actual Chapter 7 rates against those predicted by the simple model, $\widehat{P}_d^7(\beta_d^S, \alpha_0^d, \alpha_1^d)$. Panel A does this for the years used in the estimation, 2010-2014, while Panel B does this using out-of-sample predictions for the years 2015-2017.

Figure 7: Discharge and Repayment Under Uniform Steering



(a) (b)

Notes:
The vertical axis figure plots the average (expected) discharge (panel a) and recoveries (panel b) obtained by sorting the national sample of 2010-2014 debtors when all districts are assigned the constant, coefficient on disposable income, and deviation rates from a single district d^*. The horizontal axis shows the national Ch.7 rate that would occur under this sorting. "Status Quo" shows the values when districts use their own sorting. "National" shows the values when all districts sort according to the the constant, coefficient on disposable income, and deviation rates from the national model. See Online Appendix G.3.1 for details on the construction of discharges and recoveries.

A Tale of Two Bankruptcies: Geographic Differences in Bankruptcy Chapter Choice

Supplemental Appendices

Nathaniel Pattison & Daniel L. Millimet

April 2023

Appendix A Tables and Figures

Table A1: Decomposition

component	deviation ratio (%)
Total	100.00
Coefficients	14.92
β_d constant	16.20
β_d DI	16.60
β_d exemptions	-2.22
β_d means test	-3.63
β_d financial/race	-12.03
Covariates	61.10
cov. DI	53.67
cov. exemptions	0.59
cov. means test	0.03
cov. financial/race	7.09
Deviations	23.90
a_0^d	17.18
a_1^d	6.72
Residual	0.09

Notes: This table shows the contributions of specific sub-components to the component-specific deviation ratios.

Table A2: Decomposition Sensitivity

	baseline (1)	OLS (2)
Covariates	61.1	50.0
cov. DI	53.7	23.5
cov. exemptions	0.6	1.7
cov. means test	0.0	1.5
cov. financial/race	7.1	23.4
Coefficients	14.9	50.0
β_d constant	16.2	62.8
β_d DI	16.6	0.2
β_d exemptions	-2.2	-4.4
β_d means test	-3.6	-12.4
β_d financial/race	-12.0	3.7
Deviations	23.9	0.0
a_0^d	17.2	0.0
a_1^d	6.7	0.0
Residual	0.1	-0.0

Notes: This table compares decomposition results from the baseline probit model with deviations to a decomposition using district-specific linear regression models estimated with OLS. In the robustness specifications, a small number (0-3 out of 73) district-specific models did not converge. We drop these districts when computing the decomposition.

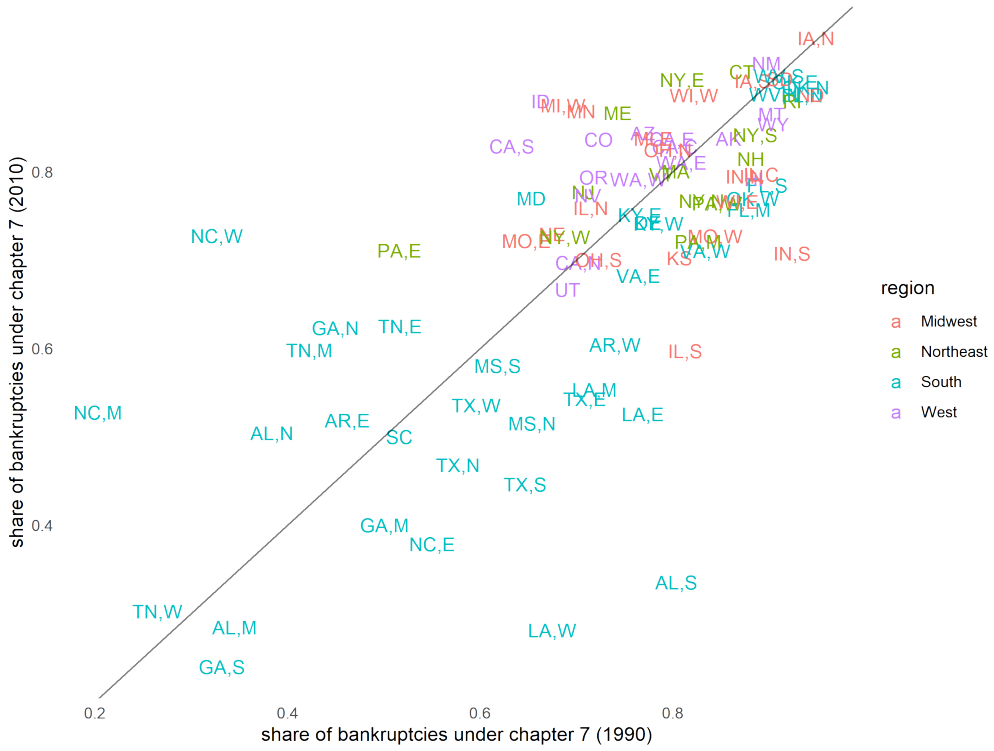
Table A3: Evaluating Model Fit

Model:	Full (1)	Simple (2)	National (3)
Coef. β:	district-spec.	mixed	national
Dev. α	district-spec.	district-spec.	national
DI sample	Share Explained		
Panel A: 2010-2014 (In-Sample)			
all	1.00	0.96	0.79
high	0.99	0.72	0.26
low	1.00	0.85	0.10
Panel B: 2015-2017 (Out-of-Sample)			
all	0.95	0.93	0.77
high	0.86	0.88	0.05
low	0.73	0.34	0.18

Notes: The model used in Column (1) corresponds to the complex model in Section 4 which uses all district-specific coefficients, β_d, and the estimated values of the deviation rates, α_0^d, α_1^d. The simple model outlined above, which uses the mixed coefficient vector, β_d^S, and the estimated values of the deviation rates, α_0^d, α_1^d, is used in Column (2). The national model, which uses β_N, α_0^N, and α_1^N and therefore imposes homogeneous sorting across districts, is used in Column (3). In each column, we measure goodness of fit using the share of the variation explained by each model.

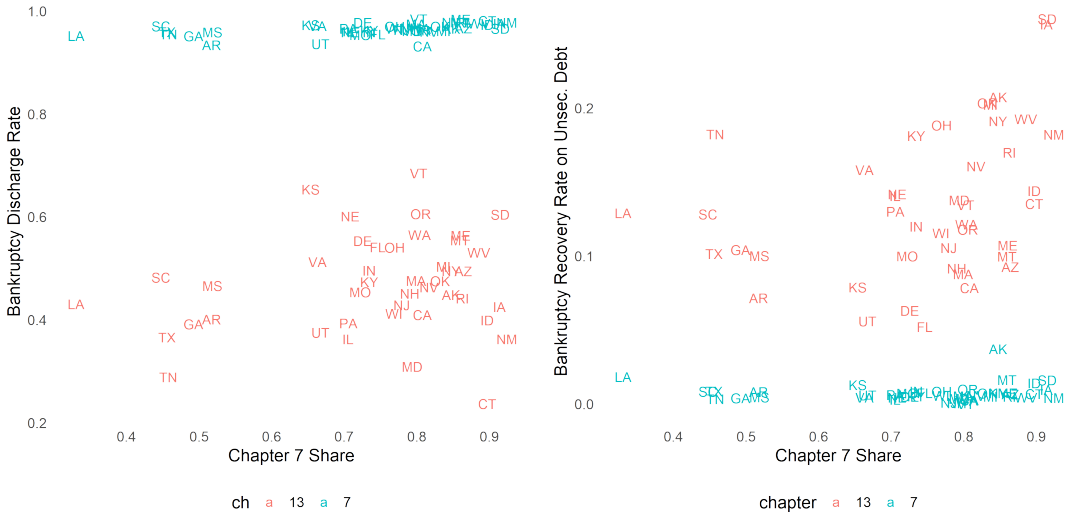
Panel A examines the in-sample model fit. The first row reports the fit measure for each model when all filers are included in the sample (DI sample = all). To focus more on heterogeneity due to sorting, we split the sample by the most important covariate, disposable income, and examine the fit of each model within more homogeneous subsamples. The high-DI (low-DI) sample consists of filers with monthly disposable income of more than (less than or equal to) \$100. In Panel B, we repeat the same exercise but using out-of-sample predictions for the years 2015-2017.

Figure A1: Persistence of Districts' Ch.7 Filing Rates



Notes: Data on 1990 bankruptcy rates are from Sullivan *et al.* (1994). The 45-degree line is plotted for comparison.

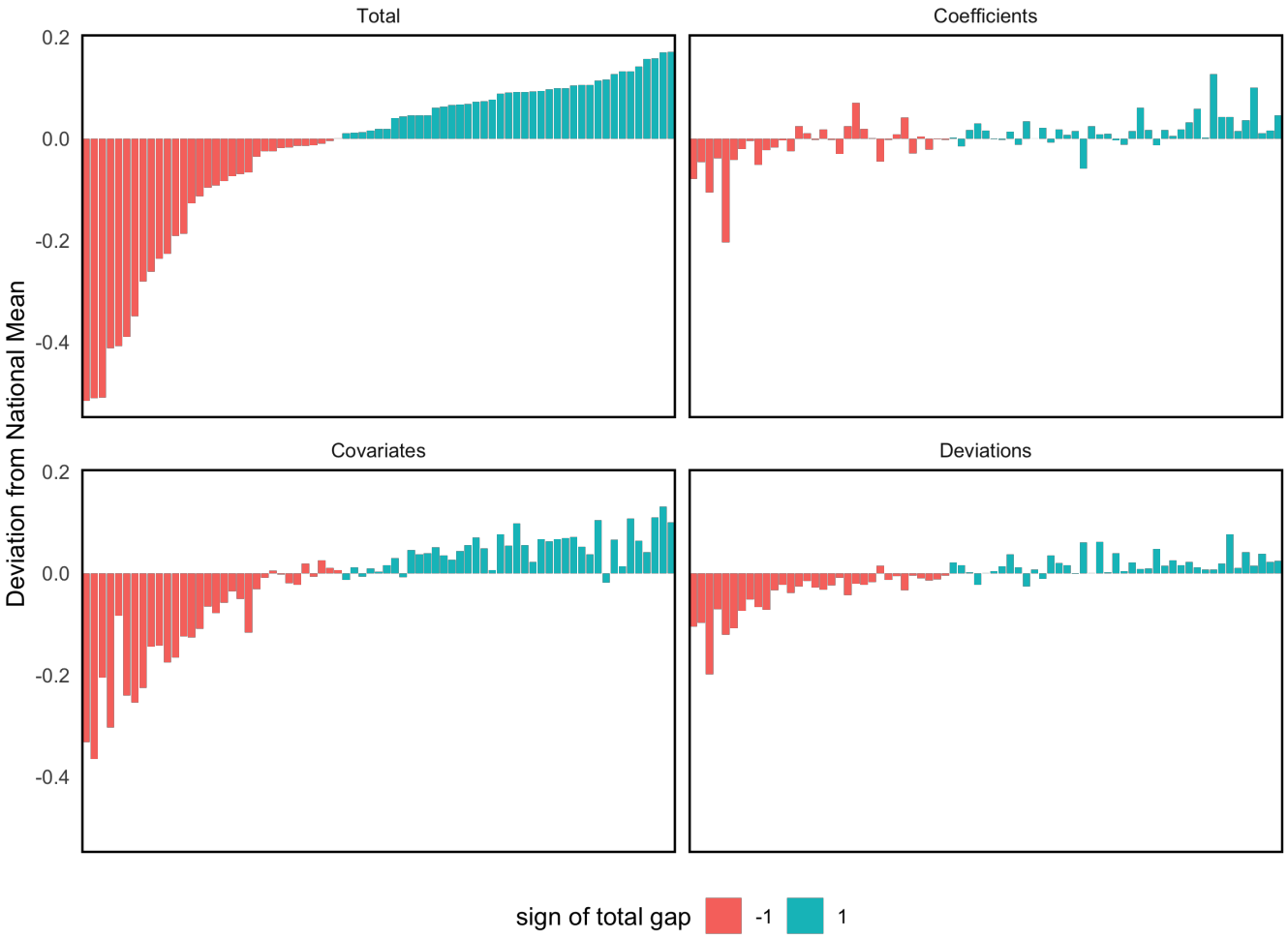
Figure A2: Discharge Rates and Recovery Rates by Chapter 7 Share



(a) Discharge Rate by Chapter (b) Recovery Rate by Chapter

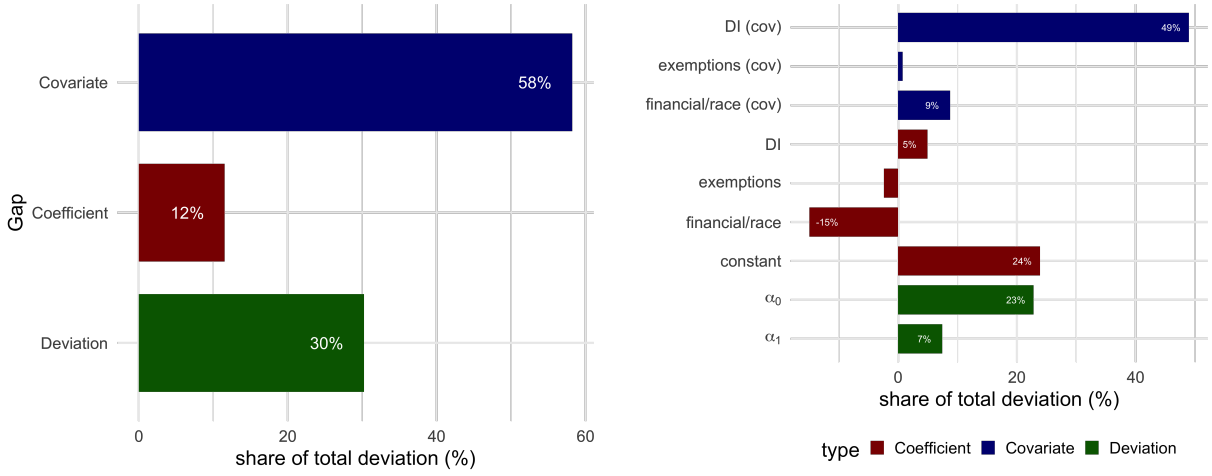
Notes: The discharge rate is the share of bankruptcy filings that obtained a discharge. The recovery rate is the share of unsecured debt returned to creditors, calculated as the total amount returned by trustees to general unsecured creditors in 2010-2014 divided by the total non-priority unsecured debt of those filing in 2010-2014. Data on discharge rates and total non-priority unsecured credit are from the Federal Judicial Center's Integrated Database. Data on the amount returned are from Trustee Final Reports, which detail actual payments to creditors.

Figure A3: Decomposition of Chapter 7 Filing Rates



Notes: Each bar represents a district, and, in all panels, districts are ordered from left to right according to the district's total gap between its Chapter filing rate and the national average of 76.7%. The top left panel displays this total gap between each district's Chapter 13 filing rate and the national mean (Δ_d^T). The remaining three panels report the district-specific gaps due to differences in coefficients (Δ_d^C), top right panel), the distributions of covariates (Δ_d^X, bottom left panel), and deviation rates (Δ_d^A), bottom right panel). Each panel also reports the deviation ratio DR for that component.

Figure A4: Decomposition for Below-Median Income Filers

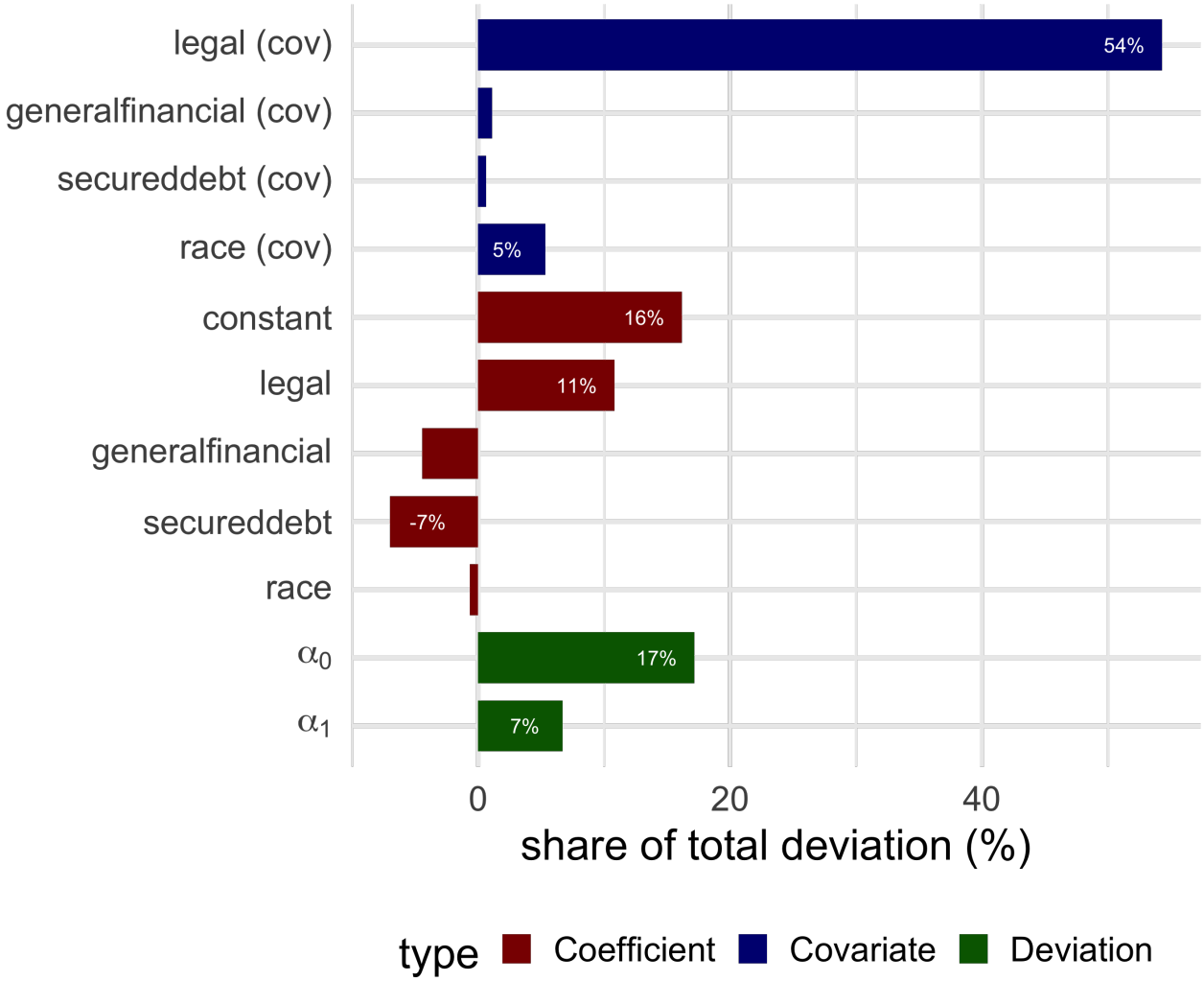


(a) Aggregate Decomposition

(b) Variable Groups

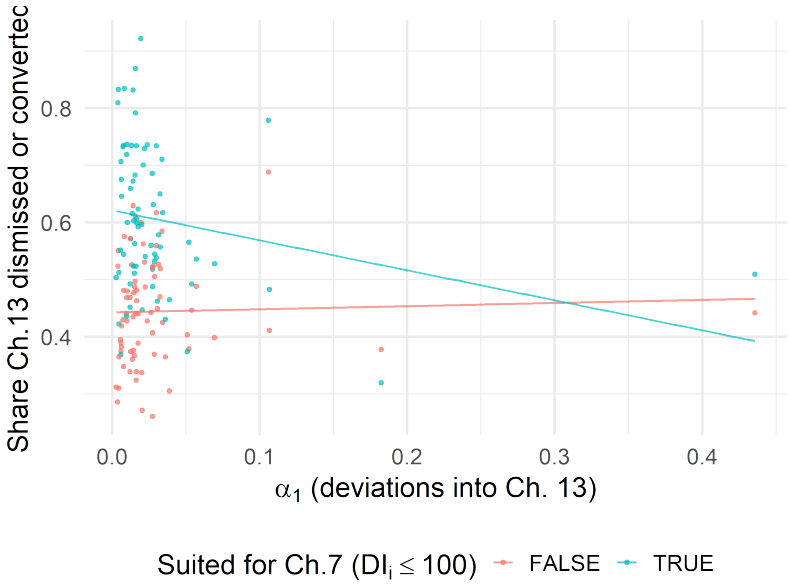
Notes: This figure recreates Figure 2, but with models estimated after restricting the sample to only below-median income filers. Figure (a) reports the aggregate decomposition according to equation (8).Figure (b) reports the subdecomposition with coefficients and covariates grouped into (i) discharges and recoveries, (ii) other factors (excluding race), and race (zip code share Black). It also separates the Deviation component into α_0 and α_1.

Figure A5: Decomposition for Financial Characteristics and Race



Notes: This figure reports the decomposition of the total geographic variation into different subcomponents. *Legal* consists of all of the legal variables from Table 1. *Generalfinancial* includes the assets-to-income tatio, debt-to-income ratio, and whether the filing was a joint filing. *Secureddebt* includes the indicator for homeownership, the amount of negative equity, the share of debt that is secured, and the share of debt that is nondischargeable. *Race* contains the share of Black residents in the filer's zip code.

Figure A6


Share Ch.13 dismissed or convertec
0.8
0.6
0.4
0.0
0.1
0.2
0.3
0.4
α_1 (deviations into Ch. 13)
Suited for Ch.7 ($DI_i \leq 100$)
FALSE
TRUE

(a)

Appendix B Quotes about Screening on Disposable Income

"Merely passing the means test doesn't automatically qualify you to file for Chapter 7 bankruptcy. The court also requires you to complete Schedule I: Your Income and Schedule J: Your Expenses. After deducting your actual monthly expenses from your current monthly income, and you have enough money left over to pay something to your creditors, the court might require you to convert or switch your Chapter 7 case to a Chapter 13 bankruptcy case." (Ohio) - https://www.bhaerman.com/what-is-bankruptcy/chapter-7-bankruptcy/are-you-eligible-to-file-for-chapter-7-bankruptcy/

"Additional qualification requirement. Even if you're exempt or pass the means test, you might not be out of the woods. The court will compare your current income reported on Schedule I: Your Income to your current expenses reported on Schedule J: Your Expenses. If enough income remains to make meaningful creditor payments, the court will convert the case to Chapter 13. Beware, because this requirement is easy to forget." - https://www.lawyers.com/legal-info/bankruptcy/bankruptcy-basics/chapter-7-bankruptcy-filing-process-explained.html "The debtor passed the means test but lost a motion to dismiss for abuse of the bankruptcy system. Schedule J, the debtor's projected future expenses, showed a monthly excess of $500. Dollars to doughnuts, the debtor's bankruptcy lawyer followed the form and the budget provided by the client. Dismissal resulted." - https://www.bankruptcymastery.com/bankruptcy-abuse-schedule-j/

"Good news! You passed the Means Test!

Bad news! You underreported your expenses on Schedule J and the trustee has filed a Motion to Dismiss your Chapter 7 case!

Many debtors and their attorneys work hard to pass the Means Test, only to run into trouble with Schedules I and J: the debtor's monthly income and expenses. This problem arises when Schedule I shows more income that Schedule J shows expenses, leaving a significant amount of excess monthly income. This is evidence of the debtor's ability to fund a repayment case, and can form the basis of a motion to dismiss in a Chapter 7 case, even when the debtor passes the Means Test. See 11 U.S.C. 707(b)(3)." - https://www.freedomlegalteam.com/passing-the-means-test-isnt-the-end-of-the-story/

"Schedule J- The Current Expenditures of Both You and Your Spouse

Schedule J is somewhat similar to Schedule I. The two Schedules work in concert to inform the bankruptcy court as to your approximate monthly budget. On Schedule J, you will include details about each of your monthly expenses. This amount will then be subtracted from the amount of net income provided on Schedule I, and will then determine what amount of disposable income you'll have every

month.

The Effect, If Any, of Your Disposable Income

You will only have qualified for Chapter 7 bankruptcy in the first place if you have passed the "means test", were not required to take the means tests, or were below the median income for your state and household size. Even if you do technically qualify for Chapter 7 bankruptcy, a bankruptcy court might nonetheless find that you are ineligible for filing for Chapter 7 bankruptcy if your budget allows for a considerable amount of disposable income every month." - `https://www.fdlawyersnm.com/bankruptcy/bankruptcy-schedules/`

"The next step is documenting income and expenses through the Schedule I and J forms, officially Form 106I and 106J. On Schedule I you list monthly income – every single place you get money from on a regular basis. Schedule J is for all your monthly expenses. The court uses this information to determine, even if you passed the means test, whether you have enough money to pay creditors. If the court thinks you do, it may convert the case to a Chapter 13 bankruptcy." - `https://www.debt.org/bankruptcy/chapter-7/chapter-7-income-limit/`

Appendix C Adjustments of Disposable Income for Conduit Districts

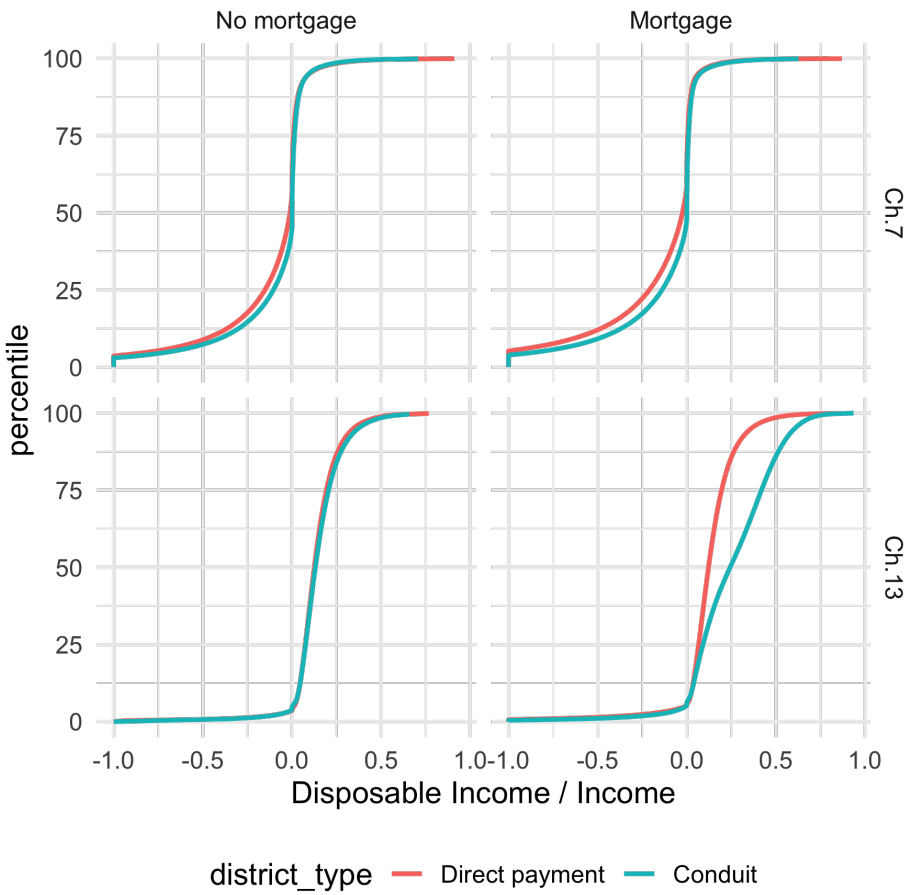
Some districts use conduit plans, in which mortgage payments are made through the Chapter 13 plan, or direct payment plans, in which debtors with a mortgage pay the mortgagor directly.[40] For our purposes, this matters because conduit districts typically exclude mortgage payments from Chapter 13 filers' Schedule J expenses. When calculating disposable income, we adjust the Chapter 13 filers' Schedule J expenses in conduit districts to account for the exclusion of mortgage payments.

We classify conduit districts and direct payments using the Chapter 13 Trustee Final Reports from 2008-2015. If ongoing mortgage payments account for at least 10% of total Chapter 13 disbursements, we classify that district as a conduit district. Districts in which ongoing mortgage payments make up less than 10% of total Chapter 13 disbursements are classified as direct payment districts.[41] Among conduit districts, ongoing mortgage payments average 30.2% of Chapter 13 total disbursements in the average district. Among direct-payment districts, ongoing mortgage payments average 1.5% of Chapter 13 total

[40] In many conduit districts, this is implemented through the local Chapter 13 plans or the practices of the local trustee. In some places, only a subset of Chapter 13 cases will be conduit plans (e.g. unless the court allows direct payment, or depending on whether a prepetition arrearage exists) (American Bankruptcy Institute, 2019).

[41] Alabama and North Carolina are not present in the Trustee Final Reports. We classify Alabama as a direct payment district and North Carolina as a conduit district, based on the similarity of Schedule J expenses to the districts we classify using the Final Reports.

Figure C1: Comparing Disposable Income of Direct-Payment and Conduit Districts



The figure plots the empirical cumulative distribution functions of the share of income that is disposable. Shares below −1 are assigned a value of −1. Shares below −1 are assigned a value of −1.The sample excludes filers with less than $500 in reported monthly income.

disbursements in the average district.

Figure C1 compares the disposable income share, i.e. the share of income that is disposable, across direct-payment and conduit districts.[42] The distributions of disposable income shares are similar across direct-payment and conduit districts, except for Chapter 13 filers with a mortgage. In conduit districts, Chapter 13 filers with a mortgage report significantly higher disposable income. In conduit districts, 43% of Chapter 13 filers with mortgages report a disposable income share above 30%. In no other district-mortgage-chapter combination do more than 10% of filers report a disposable income share above 30%. This difference in the empirical CDFs reflects that conduit districts exclude mortgage payments from Schedule J expenses.

To account for the different treatment of mortgage payments in conduit districts, we compute each filer's

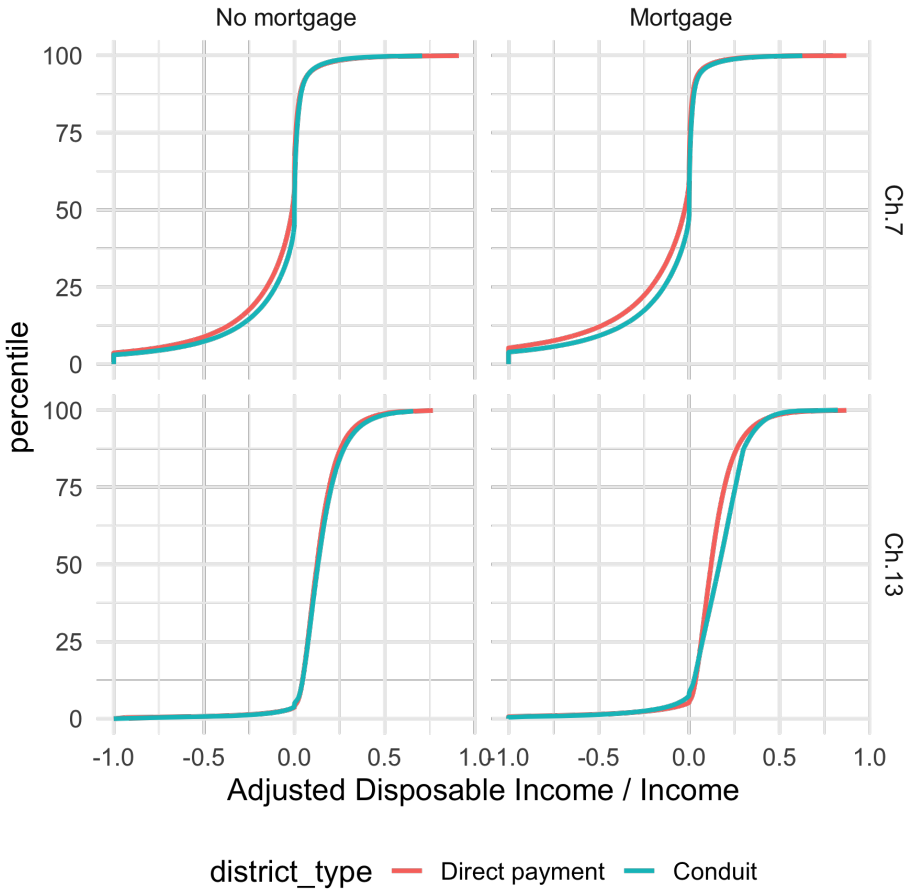
[42]Disposable income is defined as the difference between Schedule I average monthly income and Schedule J average monthly expenses.

expected monthly mortgage payment, assuming that the principal at origination equaled the reported real property value less a 6% down payment, and took out a 30-year mortgage with an annual interest rate of 7%.[43]

We then adjust Schedule J expenses by adding this expected mortgage payments to all Chapter 13 filers in conduit districts with a disposable income share of at least 30%. Figure C2 plots the empirical CDFs of the disposable income shares after making this adjustment. After adjustment, the distributions of disposable income are much more similar across conduit and non-conduit districts.

[43]The 6% down payment is the average down payment (see `https://www.rocketmortgage.com/learn/what-is-the-average-down-payment-on-a-house`). The 7% interest rate equals the presumptive interest rate applied to installment debt in many Chapter 13 districts at that time (see `https://www.mssb.uscourts.gov/rulesorders-procedures/presumptive-interest-rate/`.)

Figure C2: Adjusted Disposable Income of Direct-Payment and Conduit Districts



The figure plots the empirical cumulative distribution functions of the share of income that is disposable, adjusted for housing expenditures for Chapter 13 filers with mortgages in conduit districts. Shares below -1 are assigned a value of -1. The sample excludes filers with less than $500 in reported monthly income.

Appendix D Decomposition of Ch. 7 Variation

The model of observed bankruptcy in a given district d for filer i is given by equation (5), repeated here

$$\hat{c}_{id} \equiv \hat{\alpha}_0^d + \left(1 - \hat{\alpha}_0^d - \hat{\alpha}_1^d\right) \Phi\left(x_i \hat{\beta}_d\right) = \hat{\alpha}_0^d + \tilde{\alpha}_1^d \Phi\left(x_i \hat{\beta}_d\right). \tag{1}$$

where $\tilde{\alpha}_1^d = (1 - \hat{\alpha}_0^d - \hat{\alpha_1}^d)$. Denote the observed and predicted Chapter 7 shares in the sample for district d as

$$\bar{P}_d^7 = \frac{1}{N_d} \sum_{i=1}^{N_d} c_{id}$$
$$\tilde{P}_d^7 = \frac{1}{N_d} \sum_{i=1}^{N_d} \hat{c}_{id}.$$

Because the sample mean of the predicted probabilities from a probit model may differ slightly from the sample mean of the binary outcome, we define $\delta_d^7 \equiv \bar{P}_d^7 - \tilde{P}_d^7$ as the residual gap.

The gap in Chapter 7 rates between a given district, d, and the nation as a whole, N, is

$$\Delta_d^T \equiv \bar{P}_d^7 - \bar{P}_{\mathtt{N}}^7,$$

where $\bar{P}_{\mathtt{N}}^7$ is the Chapter 7 share in the pooled national data, i.e. the national share of bankruptcies under

Chapter 7, which is 76%. We decompose this gap as

$$
\begin{aligned}
\Delta_d^T &= \frac{1}{N_d}\sum_{i=1}^{N_d} c_{id} - \frac{1}{N_N}\sum_{i=1}^{N_N} c_{iN} \\
&= \frac{1}{N_d}\sum_{i=1}^{N_d}[\hat{\alpha}_0^d + \tilde{\alpha}_1^d \Phi(x_{id}\beta_d)] - \frac{1}{N_N}\sum_{i=1}^{N_N}[\alpha_0^N + \tilde{\alpha}_1^N \Phi(x_{iN}\beta_N)] + (\delta_d^7 - \delta_N^7) \\
&= (\hat{\alpha}_0^d - \hat{\alpha}_0^N) + \tilde{\alpha}_1^d \frac{1}{N_d}\sum_{i=1}^{N_d} \Phi(x_{id}\beta_d) - \tilde{\alpha}_1^N \frac{1}{N_N}\sum_{i=1}^{N_N} \Phi(x_{iN}\beta_N) + (\delta_d^7 - \delta_N^7) \\
&\quad -\tilde{\alpha}_1^N \frac{1}{N_d}\sum_{i=1}^{N_d} \Phi(x_{id}\beta_N) + \tilde{\alpha}_1^N \frac{1}{N_d}\sum_{i=1}^{N_d} \Phi(x_{id}\beta_N) \\
&\quad -\tilde{\alpha}_1^N \frac{1}{N_d}\sum_{i=1}^{N_d} \Phi(x_{id}\beta_d) + \tilde{\alpha}_1^N \frac{1}{N_d}\sum_{i=1}^{N_d} \Phi(x_{id}\beta_d) \\
&= \underbrace{\tilde{\alpha}_1^N \left\{ \frac{1}{N_d}\sum_{i=1}^{N_d} \Phi(x_{id}\beta_d) - \frac{1}{N_d}\sum_{i=1}^{N_d} \Phi(x_{id}\beta_N) \right\}}_{\text{Coefficient Gap}} + \underbrace{\tilde{\alpha}_1^N \left\{ \frac{1}{N_d}\sum_{i=1}^{N_d} \Phi(x_{id}\beta_N) - \frac{1}{N_N}\sum_{i=1}^{N_N} \Phi(x_{iN}\beta_N) \right\}}_{\text{Covariate Gap}} \\
&\quad + \underbrace{\left(\hat{\alpha}_0^d - \hat{\alpha}_0^N\right) + \left(\tilde{\alpha}_1^d - \tilde{\alpha}_1^N\right) \frac{1}{N_d}\sum_{i=1}^{N_d} \Phi(x_{id}\beta_d)}_{\text{Deviation Gap}} + \underbrace{(\delta_d^7 - \delta_N^7)}_{\text{Residual Gap}}
\end{aligned}
$$

Appendix D.1 Decomposition of Subcomponents

We also decompose the role of specific groups of covariates and coefficients. For example, dividing the covariates and coefficients into two groups, $x = (x^1\ x^2)$ and $\beta_d = (\tilde{\beta}_d^1\ \beta_d^2)'$, the coefficient gap can be decomposed as

$$
\begin{aligned}
\underbrace{\tilde{\alpha}_1^N \left\{ \frac{1}{N_d}\sum_{i=1}^{N_d} \Phi\left(x_{id}\beta_d\right) - \Phi\left(x_{id}\beta_N\right) \right\}}_{\text{Coefficient Gap}} =& \underbrace{\tilde{\alpha}_1^N \left\{ \frac{1}{N_d}\sum_{i=1}^{N_d} \Phi\left(x_{id}^1\beta_d^1 + x_{id}^2\beta_d^2\right) - \Phi\left(x_{id}^1\beta_N^1 + x_{id}^2\beta_d^2\right) \right\}}_{\beta_d^1 \text{ Gap}} \\
&+ \underbrace{\tilde{\alpha}_1^N \left\{ \frac{1}{N_d}\sum_{i=1}^{N_d} \Phi\left(x_{id}^1\beta_N^1 + x_{id}^2\beta_d^2\right) - \Phi\left(x_{id}^1\beta_N^1 + x_{id}^2\beta_N^2\right) \right\}}_{\beta_d^2 \text{ Gap}}
\end{aligned}
$$

Similarly, the covariate gap can be decomposed as

$$\underbrace{\tilde{\alpha}_1^N \left\{ \frac{1}{N_d} \sum_{i=1}^{N_d} \Phi(x_{id}\beta_N) - \frac{1}{N_N} \sum_{i=1}^{N_N} \Phi(x_{iN}\beta_N) \right\}}_{\text{Covariate Gap}}$$

$$= \underbrace{\tilde{\alpha}_1^N \left\{ \frac{1}{\tilde{N}} \sum_{i=1}^{\tilde{N}} \Phi\left(x_{id}^1\beta_N^1 + x_{id}^2\beta_N^2\right) - \frac{1}{\tilde{N}} \sum_{i=1}^{\tilde{N}} \Phi\left(x_{iN}^1\beta_N^1 + x_{id}^2\beta_N^2\right) \right\}}_{x^1 \text{ Gap}}$$

$$+ \underbrace{\tilde{\alpha}_1^N \left\{ \frac{1}{\tilde{N}} \sum_{i=1}^{\tilde{N}} \Phi\left(x_{iN}^1\beta_N^1 + x_{id}^2\beta_N^2\right) - \frac{1}{\tilde{N}} \sum_{i=1}^{\tilde{N}} \Phi\left(x_{iN}^1\beta_N^1 + x_{iN}^2\beta_N^2\right) \right\}}_{x^2 \text{ Gap}}.$$

One complication for the terms involving mixtures of x^1 and x^2 from two different samples is that $N_d \neq N_N$. Following Fairlie (2005), we set $\tilde{N} = \min\{N_d, N_N\}$ and, for the district with the larger sample, a random sample (without replacement) of size $\tilde{N}$. Extensions to more than two groups of covariates and coefficients are straightforward. However, in these decompositions, the order of decomposition matters. To overcome this, we compute the average gaps over all possible orderings.

Finally, the deviation gap can be decomposed as

$$\underbrace{\left(\alpha_0^d - \alpha_0^N\right) + \left(\tilde{\alpha}_1^d - \tilde{\alpha}_1^N\right) \frac{1}{N_d} \sum_{i=1}^{N_d} \Phi\left(x_{id}\beta_d\right)}_{\text{Deviation Gap}}$$

$$= \underbrace{\left(\alpha_0^d - \alpha_0^N\right) \left\{ 1 - \frac{1}{N_d} \sum_{i=1}^{N_d} \Phi\left(x_{id}\beta_d\right) \right\}}_{\text{Ch. 7 Deviation Gap}} + \underbrace{\left(-\alpha_1^d + \alpha_1^N\right) \frac{1}{N_d} \sum_{i=1}^{N_d} \Phi\left(x_{id}\beta_d\right)}_{\text{Ch. 13 Deviation Gap}}.$$

Appendix E Endogenous Deviation Rates

In Section 5.3, we show that districts differ in the likelihood of dismissing cases they view as bad fits, and that these dismissal rates are highly correlated with our estimates of the deviation rates α_0 and α_1. These deviation rates could reflect differences in local legal culture, i.e., some districts exogenously scrutinize their cases more closely. The deviations could also be determined endogenous, however, if districts optimally adjust their scrutiny depending on the types of debtors entering bankruptcy within their district. In this section, we develop a model of optimal scrutiny and show that some of the variation in deviation rates is due to endogenous responses of districts to the types of debtors filing for bankruptcy. We find that a around one-quarter of the heterogeneity in α_0 deviation rates, and one-tenth of the heterogeneity in α_1 deviation rates, can be rationalized by districts' endogenous choice of the level of scrutiny.

Appendix E.1 Optimal Scrutiny

Consistent with the model in Section 4, let $x_i\beta_d^7$ denote the value that district d obtains from placing filer i in Chapter 7. The corresponding value from placement in Chapter 13 is $x_i\beta_d^{13} - \epsilon_i$, where ϵ_i captures idiosyncratic factors that affect the benefit of Chapter 13 relative to Chapter 7. The district prefers filer i in Chapter 7 if $x_i\beta_d + \epsilon_i \geq 0$, where $\beta_d \equiv \beta_d^7 - \beta_d^{13}$. Assuming $\epsilon \sim N(0,1)$, and recognizing that steering is imperfect, the average (over ϵ) value to district d from a filer with characteristics x_i is[44]

$$V_d(x_i;\beta_d) = x_i\beta_d^{13} + x_i\beta_d\left\{\alpha_0^d + (1-\alpha_0^d-\alpha_1^d)\Phi(x_i\beta_d)\right\} + (1-\alpha_0^d-\alpha_1^d)\phi(x_i\beta_d),$$

where the first term, $x_i\beta_d^{13}$, reflects the value of placing the filer in Chapter 13, the middle term reflects the change in value (based on observed characteristics) from moving the filer into Chapter 7 multiplied by the probability the filer ends up in Chapter 7 (accounting for both steering and deviations), and the final term reflects the impact of sorting on idiosyncratic factors, ϵ_i.

In the absence of deviations, districts would sort filers to maximize V_d. As such, deviations necessarily entail debtors moving to a suboptimal chapter from the district's perspective. This implies that higher values of α_0^d and α_1^d necessarily reduce the filer's value to the district; equivalently, $\frac{\partial V_d(x_i;\beta_d)}{\partial \alpha_j^d} < 0$ for $j = 0, 1$.

With endogenous scrutiny, districts can reduce the deviation rates by increasing their scrutiny of Chapter 7 (Chapter 13) filings, denoted by s_0^d (s_1^d). Scrutiny can be adjusted by the district, at a cost,

[44] This derivation use the fact that for $\epsilon \sim N(0,1)$, $E(\epsilon|a > \epsilon > b) = -\frac{\phi(b)-\phi(a)}{\Phi(b)-\Phi(a)}$. This implies that $\int_\epsilon \epsilon\, \mathtt{1}(\epsilon < -\mathtt{x_i}\beta_\mathtt{d})\mathtt{d\Phi}(\epsilon) = -\phi(\mathtt{x_i}\beta_\mathtt{d})$ and $\int_\epsilon \epsilon\, \mathtt{1}(\epsilon \geq -\mathtt{x_i}\beta_\mathtt{d})\mathtt{d\Phi}(\epsilon) = \phi(\mathtt{x_i}\beta_\mathtt{d})$.

by committing to audits for a certain share of filings or by adjusting their oversight of filers' self-reported financial information. As discussed in Section 5.3, we assume that deviation rates are declining in the level of scrutiny chosen by the district. As such, we normalize the units of scrutiny in each chapter to the amount needed to obtain a specific deviation rate such that $s_0^d = 1 - \alpha_0^d$ and $s_1^d = 1 - \alpha_1^d$. The costs of scrutiny are determined by strictly convex cost functions, $f_0(\cdot)$ and $f_1(\cdot)$, which are assumed to be common to all districts.

Given this, the district chooses the optimal level of scrutiny in each chapter to maximize

$$W_d(s_0^d, s_1^d; \beta_d) = \max_{s_0^d, s_1^d} \quad E_{X|d}\left[V_d(x_i; \beta_d)\right] - f_0(s_0^d) - f_1(s_1^d)$$

where $E_{X|d}[\cdot]$ is the expectation over all the characteristics x of filers within district d. The first-order conditions equate the marginal benefit and cost of additional scrutiny, given by

$$E_{X|d}\left[\frac{\partial V_d(x_i; \beta_d)}{\partial s_0^d}\right] = f_0'(s_0^d) \quad \text{and} \quad E_{X|d}\left[\frac{\partial V_d(x_i; \beta_d)}{\partial s_1^d}\right] = f_1'(s_1^d), \tag{2}$$

where[45]

$$\begin{aligned} \frac{\partial V_d(x_i; \beta_d)}{\partial s_0^d} &= -x_i\beta_d\left[1 - \Phi(x_i\beta_d)\right] + \phi(x_i\beta_d) > 0 \\ \frac{\partial V_d(x_i; \beta_d)}{\partial s_1^d} &= x_i\beta_d\Phi(x_i\beta_d) + \phi(x_i\beta_d) > 0. \end{aligned} \tag{3}$$

Intuitively, a marginal increase in Chapter 7 scrutiny, s_0^d, increases the value of a filing by the value of switching that filer into Chapter 13, $-x_i\beta_d$, multiplied by the probability that the district prefers the filer in Chapter 13, $1 - \Phi(x_i\beta_d)$. Moreover, additional scrutiny improves sorting based on idiosyncratic factors as reflected in the second term, $\phi(x_i\beta_d)$. Note, while the costs of scrutiny are homogeneous, the benefits are not. Consequently, differences in the distribution of filer characteristics, x_i, and district preferences, β_d, will lead to endogenous differences in optimal levels of scrutiny.

To proceed, we solve for the levels of scrutiny in district d that maximize $W_d\left(s_0^d, s_1^d; \beta_d\right)$. Assuming the costs functions for scrutiny take the form $f_j(s_j) = c_j(s_j)^{\gamma_j}$, with $\gamma_j > 1$, and defining $Z_d^j\left(\widetilde{\beta}_d\right) \equiv$

[45] To see that $\frac{\partial V_d(x_i);\beta_d}{\partial s_0^d} > 0$ for all finite $x_i\beta_d$, consider the function $f(y) = -y(1 - \Phi(y)) - \phi(y)$. As $y \to -\infty$, $f(y) \to \infty$. Using L'Hopital's rule, $lim_{y\to\infty} f(y) = 0$. Finally, using the fact that $\frac{d}{dy}\phi(y) = -y\phi(y)$, $f'(y) = -[1 - \Phi(y)]$, which is less than zero for all finite y. Thus, $f(y)$ monotonically decreases from ∞ to 0 as y increases. Thus, $f(y) > 0$ for all finite y.

Table E1: Estimating Costs of Scrutiny

	Dependent variable:	
	$log(s_0)$	$log(s_1)$
	(1)	(2)
$log(Z_0^d)$	0.072^{***}	
	(0.014)	
$log(Z_1^d)$		0.043^{***}
		(0.015)
Constant	-0.227^{***}	-0.102^{***}
	(0.016)	(0.025)
Observations	73	73
R^2	0.264	0.111
Note:	*p<0.1; **p<0.05; ***p<0.01	

$E_{X|d}\left[\frac{\partial V_d(x_i;\widetilde{\beta}_d)}{\partial s_j^d}\right]$, $j = 0, 1$, the first-order conditions in Equation (2) imply that

$$\log\left(s_0^d\right) = -\frac{1}{\gamma_0 - 1}\log(c_0\gamma_0) + \frac{1}{\gamma_0 - 1}\log\left(Z_0^d\left(\widetilde{\beta}_d\right)\right)$$
$$\log\left(s_1^d\right) = -\frac{1}{\gamma_1 - 1}\log(c_1\gamma_1) + \frac{1}{\gamma_1 - 1}\log\left(Z_1^d\left(\widetilde{\beta}_d\right)\right).$$

Using the fact that $s_j^d \equiv 1 - \alpha_j^d$, these equations can be rewritten as

$$\log\left(1 - \hat{\alpha}_j^d\right) = \delta_{0,j} + \delta_{1,j}\log\left(\hat{Z}_j^d\left(\widetilde{\beta}_d\right)\right) + u_j^d, \qquad j = 0, 1 \tag{4}$$

where u_j^d captures the estimation error due to the use of $\hat{\alpha}_j^d$ and $\hat{Z}_j^d(\cdot)$ in construction of the dependent and independent variables, respectively.[46] $\hat{Z}_j^d(\cdot)$ is obtained using Equation (3) as well as the prior estimates of $\widetilde{\beta}_d$.

The results are in Table E1. The simple linear models explain 26% of the variation in the Chapter 7 deviation rates (technically, $log(1 - \alpha_0^d)$) and 10% of the geographic variation in Chapter 13 deviations rates (technically, $log(1 - \alpha_1^d)$). This indicates that a nontrivial share of the variation in deviation rates can be explained by optimal responses to the district's local legal culture β_d and the distribution of filer characteristics.

[46]Note, u_j^d will also capture all other district-specific determinants of scrutiny that are not captured by the model.

Appendix F Potential Manipulation of Disposable Income

We investigate sensitivity to misreporting in several ways, with the results summarized in Figure F1. The figure shows the share of the aggregate geographic variation in chapter choice explained by the covariate gap attributable to disposable income, DI, under different specifications. As a benchmark, the first bar shows that DI explains 54% of aggregate geographic variation in our baseline specification.

Our first strategy splits reported disposable income—defined as the gap between reported income and reported expenses—into two parts, DI^{IRS} and DI^{res}, given by

$$\begin{aligned} DI &= \text{Income} - \text{Expenses} \\ &= \underbrace{(\text{Income} - \text{IRS Allowable Expenses})}_{DI^{\text{IRS}}} + \underbrace{(\text{IRS Allowable Expenses} - \text{Expenses})}_{DI^{\text{res}}}, \end{aligned}$$

where DI^{IRS} is reported income less Internal Revenues Service (IRS) allowable expenses and DI^{res} is the difference between IRS allowable expenses and reported expenses. Because reported income can be verified with bank statements and pay stubs, misreporting, to the extent it exists, would likely occur on the expense side. DI^{IRS} replaces self-reported expenses with IRS allowable expenses. As such, there is less margin to misreport in DI^{IRS}. DI^{res}, on the other hand, reflects true differences between actual filer expenses and IRS allowable expenses as well as manipulation of expenses.

With disposable income split into two separate covariates, we re-do the decomposition treating DI^{IRS} and DI^{res} as separate covariates.[47] If the majority of the role played by disposable income in our initial analysis is due to DI^{IRS}, this is suggestive of a small role of misreporting. The results from this new decomposition are shown in the second bar, labeled "split DI", in Figure F1. We find that of the 54% of the aggregate geographic variation in chapter choice explained by the covariate gap attributable to disposable income in the baseline model, DI^{IRS} (DI^{res}) explains 33% (23%). Thus, the majority of the geographic variation explained by differences in the distribution of reported disposable income found in the baseline model is driven by differences in income and allowable expenses, which are less subject to misreporting.

Our second strategy for assessing the potential role of manipulation entails conducting a donut sensitivity analysis. Specifically, we omit filers with disposable income in the neighborhood around $100 per month. We choose $100 based on Figure 3 which shows a precipitous drop in Chapter 7 filings near

[47] Note, we do not re-estimate the models but instead assign both variables, DI^{IRS} and DI^{res}, the estimated coefficient on disposable income from the baseline model. As discussed above, although disposable income may be mismeasured, our analysis consistently estimates district responses to *reported* disposable income.

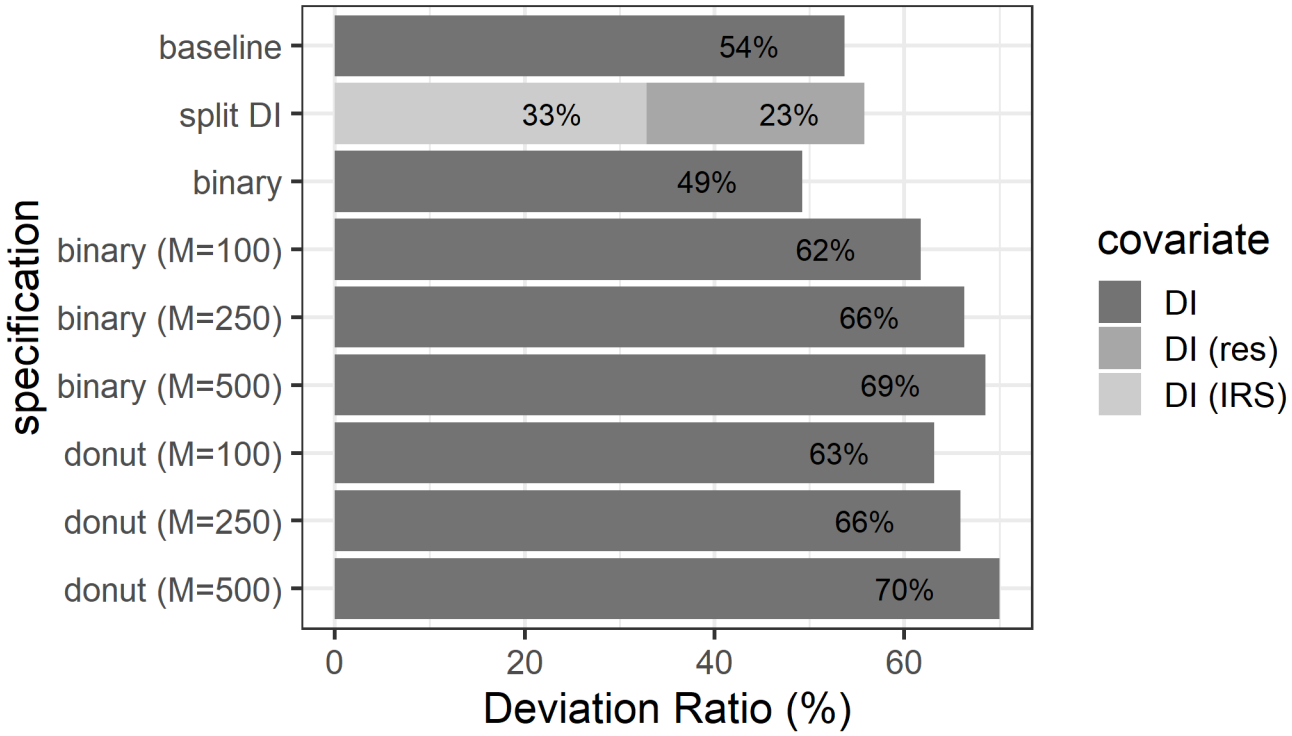
$100 in the national sample. Combining this with the fact that severe misreporting is unlikely due to the safeguards mentioned above, filers with true disposable income close to the $100 cutoff are the most likely to manipulate if such manipulation occurs. Thus, we re-do the analysis omitting filers with reported disposable income within $\$M$ of $100 (i.e., filers where $|DI_i - 100| < M$). We do this separately for $M = \$100, \$250, \$500$, re-estimating the models on each new sample then re-doing the decomposition analysis. In these decompositions, the share explained by the DI is shown in the two bars labeled "donut" in Figure F1. The results indicate that the aggregate geographic variation in chapter choice explained by the covariate gap attributable to disposable income increases from 54% in the baseline specification to 63%, 66%, and 70% when M is set to $100, $250, and $500, respectively.

As a final strategy, we replace our continuous measure of disposable income with a binary variable equal to one if reported disposable income is above $100 and zero otherwise. Measurement error in this binary indicator only occurs if manipulation by filers causes reported disposable income to cross the $100 threshold. To reduce this possibility, we also perform the previous donut sensitivity analysis using the binary disposable income measure. Specifically, we omit filers with $|DI_i - 100| < M$ for $M = \$100, \$250, \$500$ and then convert the continuous disposable income variable into its binary counterpart for the filers remaining in the sample. The results are shown in the final three bars, labeled "binary", in Figure F1. The results indicate that the aggregate geographic variation in chapter choice explained by the covariate gap attributable to disposable income decreases marginally, from 54% in the baseline specification to 49%, when including all filers in the analysis. When using the binary variable in the donut samples, the share attributed to the covariate ranges between 62% and 70%. Overall, Figure F1 shows that the importance of the disposable income in understanding geographic variation in chapter choice is robust to several different methods for addressing manipulation.

While our main focus in this section is on robustness of the share of aggregate geographic variation in chapter choice explained by the disposable income, the full decomposition results from the new specifications used in Figure F1 are reported in Table F1. A few interesting results stand out. First, as M increases from zero to $500, the share of the variation in chapter choice explained by the covariate disposable income increases, while the share explained by estimated coefficients on disposable income decreases. This is because, for filers with reported disposable income far from $100, there is little heterogeneity across districts in how they are sorted. Specifically, the overall coefficient gap falls from 17% in the baseline model to 6% (4%) when M is set to $250 ($500). Finally, the estimated deviation rates become smaller as M increases as well. For example, α_0 declines from 17% in the baseline model to 11% (8%) when M is set

to $250 ($500). Together, these results indicate that heterogeneity in the sorting preferences of districts (i.e., local legal culture) and the deviation rates of filers is a significant contributor to overall geographic variation in chapter choice through their effect on filers with reported disposable income close to $100. This makes sense, given our discussion of heterogeneous thresholds across districts in Section 5.3. For filers away from this threshold, the vast majority of geographic variation in chapter choice is due to differences in the distribution of observed filer characteristics, with disposable income being the primary cause.

Figure F1: Decomposition Ratio for Observed Disposable Income



Based on results in Table F1.

Table F1: Decomposition Sensitivity

	baseline	split DI	baseline ($M = 100$)	baseline ($M = 250$)	baseline ($M = 500$)	binary	binary ($M = 100$)	binary ($M = 250$)	binary ($M = 500$)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Covariates	61.1	61.1	70.4	77.4	81.5	67.7	77.0	81.7	85.0
cov. DI	53.7		63.1	65.9	70.0	49.3	61.7	66.3	68.5
cov. DI (IRS)		32.9							
cov. DI (resid)		22.9							
cov. exemptions	0.6	0.4	0.3	0.6	0.8	0.7	0.7	0.7	0.9
cov. means test	0.0	0.0	0.1	0.7	2.4	2.6	3.0	5.0	9.5
cov. financial/race	7.1	5.2	6.8	9.6	8.3	15.1	11.7	9.4	5.9
Coefficients	14.9	14.9	10.9	8.3	7.2	21.7	16.7	11.9	9.5
β_d constant	16.2	14.9	12.0	11.3	5.7	32.5	24.0	11.1	4.7
β_d DI	16.6		9.9	5.5	4.4	14.5	11.4	11.8	12.5
β_d DI (IRS)		-14.7							
β_d DI (resid)		30.7							
β_d exemptions	-2.2	-2.1	-0.5	0.3	0.5	-3.7	-0.5	0.9	1.5
β_d means test	-3.6	-3.2	-2.9	-3.3	-2.3	-7.0	-5.9	-5.6	-4.8
β_d financial/race	-12.0	-10.8	-7.5	-5.5	-1.1	-14.6	-12.4	-6.2	-4.4
Deviations	23.9	23.9	18.7	14.2	11.2	10.6	6.4	6.4	5.5
a_0^d	17.2	17.2	14.4	11.0	7.9	4.3	3.3	3.6	3.4
a_1^d	6.7	6.7	4.3	3.2	3.4	6.4	3.1	2.8	2.1
Residual	0.1	0.1	0.0	0.0	0.0	-0.0	-0.1	-0.0	-0.0

Notes: This table shows the contributions of specific sub-components to the component-specific deviation ratios across different specifications. Drop \$100, drop \$250 and drop \$500 drop individuals with an absolute value of reported disposable income minus \$100 less than those values. The header "baseline" indicates that disposable income (DI) is measured continuously, while "binary" indicates the use of a binary indicator for whether disposable income exceeds \$100 per month.

Appendix G Discharge and Repayment In Bankruptcy

The appendix details how we compute discharge and repayment in Chapter 7 and Chapter 13.

Appendix G.1 Overview

Calculating discharge and repayment amounts, particularly for Chapter 13 filers with income above the state median, is complicated. Our calculations provide approximations that adhere to many aspects of bankruptcy law and common practices, but necessarily abstract from some nuances and district variation.

Under Chapter 7, the amount repaid to unsecured creditors equals the minimum of (i) the filer's unsecured debt and (ii) the non-exempt assets that the filer holds, which depends on the filer's assets and state and federal asset exemptions levels. Following Pattison and Hynes (2020), non-exempt assets are approximated by subtracting the maximum applicable homestead exemption from a measure of the filer's home equity: the difference between the value of real property and secured debt. After adjusting for priority debts and non-dischargeable debts (e.g., student loans), we calculate the share of non-exempt assets that would go towards repaying dischargeable unsecured debts. Formally, the recovery and discharge amounts in Chapter 7 bankruptcy, denoted by R_i^7 and D_i^7 respectively, are

$$\begin{aligned} R_i^7 &= \min\{\texttt{nonexempt}_i, \texttt{unsecured}_i\} \\ D_i^7 &= \max\{\texttt{dischargeable unsecured}_i - \texttt{pay unsecured}_i^7, 0\}, \end{aligned}$$

where $\texttt{nonexempt}_i$ is the total non-exempt unsecured debt for filer i, $\texttt{unsecured}_i$ is total unsecured debt, $\texttt{dischargeable unsecured}_i$ is the dischargeable unsecured debt, and $\texttt{pay unsecured}_i^7$ is the amount repaid to dischargeable creditors, which equals R_i^7 multiplied by the share of unsecured debt that is dischargeable. While this is a simplification of the actual discharge and repayment under Chapter 7, it captures the significant determinants of repayment and discharge for the large majority of Chapter 7 filers, as well as what Chapter 13 filers would repay had they filed Chapter 7.

Chapter 13 requires that filers repay with their full disposable income during the length of the plan, so the primary determinants of the amount repaid (conditional on plan completion) are (i) the length of the plan and (ii) disposable income. We set the baseline Chapter 13 plan length, T_i, to 36 months for filers with current monthly income below the state median income (adjusted for household size) and 60 months for those with income above the state median (Tabb, 2020).[48] We compute the filers' monthly

[48]Note, we shorten the plan length for filers whose disposable income would allow them to repay their debts in full before

repayment, m_i, as disposable income, defined as reported (Schedule I) income less expenses. Much of the complexity and disagreement across districts concerns exactly how expenses calculated, particularly for filers with income above the state median. Following common practices, we use actual reported expenses for filers with income below the state median and the maximum of reported expenses and IRS allowable expenses for filers with income above the median, with other adjustments for mortgage expenses. Finally, we apply the best interest of the creditors test, which requires that unsecured creditors receive at least as much as they would in Chapter 7. Formally, the amount recovered by general unsecured creditors in Chapter 13, denoted as R_i^{13}, is

$$R_i^{13} = \max\{m_i T_i, R_i^7\} \tag{5}$$

As with Chapter 7, we account for priority and nondischargeable debts when calculating expected discharges. The *expected* amount of debt discharged in a completed Chapter 13 plan is

$$D_i^{13} = \max\{\texttt{dischargeable unsecured}_i - \texttt{pay unsecured}_i^{13}, 0\}.$$

In the remainder of this section, we provide more details about the practices informing these calculations of discharges and repayment.

Appendix G.2 Chapter 7

In Chapter 7 bankruptcy, nearly all debtors obtain a full discharge of unsecured debts and unsecured creditors rarely receive payments. The amount repaid equals the amount of non-exempt equity debtors hold, which depends on the debtors' assets a combination of state and federal exemption levels. We measure non-exempt assets as the amount of non-exempt home equity debtors hold, where home equity is calculated as the difference between filers' real property and their secured debt. Although this measure is imperfect, Pattison and Hynes (2020) shows it closely follows actual home equity reported in a sample of bankruptcy filings. With this measure of home equity, we then calculate non-exempt home equity by subtracting the maximum applicable homestead exemption as in Pattison and Hynes (2020), using single-filer exemptions for single filings and married filer exemptions for joint filings.

The total repayment to unsecured creditors in Chapter 7 is then the minimum of non-exempt equity

completion of the baseline plan.

and the filer's total unsecured debt

$$R_i^7 = \min\{nonexempt_i, unsecured_i\}.$$

This determines the amount that will be repaid to creditors.[49] The remaining amount owed to unsecured creditors may be discharged, depending on whether it is dischargeable.

The amount of debt discharged by the debtor upon completion of the plan depends on the total amount paid to unsecured creditors and the types of unsecured debt that the filer holds. Priority debts (e.g., domestic support arrears, taxes, and some civil claims) must be paid in full before disbursements to general unsecured creditors. The money left after priority debts have been paid is disbursed pro rata among general unsecured creditors, i.e., in proportion to the creditor's share of the debtor's total general unsecured debt. Some types of general unsecured debt, such as student loans, pension obligations) are nondischargeable.[50] Thus, the amount paid to dischargeable general unsecured creditors is

$$pay\_unsecured_i^7 = \max\{(R_i^7 - priority\_unsecured_i)share\_dischargeable_i, 0\}$$

where $share\_dischargeable_i$ is the share of general unsecured debt that is dischargeable. The total amount discharged in Chapter 7 is then

$$D_i^7 = \max\{dischargeable\_unsecured_i - pay\_unsecured_i^7, 0\}.$$

Our measures of repayment and discharge are a simplification of the actual discharge and repayment in Chapter 7. Debtors may be denied a discharge and others may be required to forfeit unmeasured non-exempt assets to repay creditors. In practice, however, both of these events are rare. As seen in Table 1, 96% of Chapter 7 filers obtain a discharge. As for non-exempt assets, only 5% of Chapter 7 cases have any non-exempt assets, and the assets collected in these cases are primarily small-dollar items such as tax rebates that repay little to creditors (Flynn *et al.*, 2003; Jiménez, 2009; Hynes and Pattison, 2022). Even among cases with nonexempt, then, most cases return very little to unsecured creditors. Indeed, more than half of all disbursements to creditors in Chapter 7 come from top 0.3% percent of cases.

One potential concern is that we use the formulas above to calculate counterfactual repayment and discharge in Chapter 7 by current Chapter 13 filers. It is possible that Chapter 13 filers, if they had

[49] We could subtract the percentage paid to a Chapter 7 trustee, but it makes little difference.

[50] We calculate these nondischargable general unsecured debts as $\max\{total\_nondischargeable_i - priority\_unsecured_i, 0\}$.

filed Chapter 7, would have had to forfeit assets (other than home equity) more frequently than current Chapter 7 filers. The available evidence suggests, however, that this is not the case. Using detailed data from Chapter 13 cases filed in Cook County, Illinois, however, Morrison and Uettwiller (2017) found that 58% of successful Chapter 13 cases and 77% of unsuccessful (no discharge) Chapter 13 cases would have paid unsecured creditors nothing in Chapter 7.

Appendix G.3 Chapter 13

Repayment in Chapter 13 is substantially more complex. This appendix provides additional information on how we calculate Chapter 13 plan recoveries unsecured creditors and the discharge of unsecured debt. The total Chapter 13 payments to (general) unsecured creditors, conditional on completion of the repayment plan, depends on (i) the monthly plan payments, (ii) the duration of the plan, and (iii) the types of unsecured debt (general, priority, and nondischargeable). We summarize our method for computing repayment and discharge first, and provide additional institutional details below.

The Bankruptcy Code requires that the monthly plan payments are equal to the debtor's disposable income, and we discuss how we calculate disposable income below. From the monthly payment, the Chapter 13 trustee takes a percentage fee to cover administrative expenses, which averages 6.5% across trustees during our sample period. As a result, the total amount paid to creditors each month is $m_i = (1 - 0.065) \cdot disposable\_income_i$.

We set the baseline Chapter 13 plan length to 36 months for filers with current monthly income below the state median income (adjusted for household size) and 60 months for those with above-median income (Tabb, 2020). If, however, a debtor's monthly payments would allow them to repay unsecured creditors in full before the baseline plan length, we set the plan length, T_i, to this shorter duration.

Thus far, the total plan payments to unsecured creditors for a completed plan are $m_i T_i$. We then apply the best interest of the creditors test, which requires that unsecured creditors receive at least as much as they would in Chapter 7, i.e., ${R_i}^7$. Thus, the total amount recovered by all unsecured creditors is

$$R_i^{13} = \max\{m_i T_i, R_i^7\}. \tag{6}$$

As described for Chapter 7, the amount discharged also depends upon the amount of debt that is priority and nondischargeable. Thus, the amount paid to dischargeable general unsecured creditors is

$$pay\_unsecured_i^{13} = \max\{(R_i^{13} - priority\_unsecured_i) share\_dischargeable_i, 0\}$$

where $share\_dischargeable_i$ is the share of general unsecured debt that is dischargeable. The total amount of debt discharged in a completed Chapter 13 plan is

$$D_i^{13} = \max\{dischargeable\_unsecured_i - pay\_unsecured_i^{13}, 0\}.$$

Appendix G.3.1 Disposable Income and Monthly Payments

How to calculate disposable income is a complicated issue, particularly for above-median-income debtors, with variation across districts and over time from district practices and court rulings. The lack of detailed knowledge about the practices in each district, which are often embedded in unwritten local practices, as well as the lack of some variables in the data, make it impossible to accurately capture exactly how chapter 13 disposable income is calculated in every district. Instead, we adopt a measure of disposable income that is uniform across all districts and reflects recent interpretations of the Bankruptcy Code.

Prior to BAPCPA, bankruptcy required that debtors' monthly payment equal their disposable income, defined as income less "reasonable and necessary expenses" (Showel, 2008). This was calculated as the filer's income listed on Schedule I, less the filer's actual expenses listed on Schedule J, although there was some judicial discretion as to what expenses and amounts were "reasonable and necessary." After BAPCPA, the disposable income calculations for below-median income filers remain largely the same. For below-median filers, the "difference between your income on Schedule I and your expenses on Schedule J will be your Chapter 13 plan payment " (O'Neill, 2022). Consequently, we calculate the monthly payments for below-median income debtors as the difference between the debtor's (forward-looking) average monthly income and expenses as reported on Schedule I and J (adjusted for conduit districts, discussed below). This is a close approximation to actual Chapter 13 payments for below-median-income filers.

For above-median filers, BAPCPA requires that they repay their "projected disposable income," a phrase that was not defined. As a result, "[a]rguably no change in BAPCPA has generated as fundamental a difference in the bankruptcy courts' reported opinions as how to determine projected disposable income for above median family income debtors in chapter 13 and, therefore, what such debtors are required to pay to unsecured creditors in their chapter 13 plans" (Waldron and Berman, 2007). The main issues were that BAPCPA provided a mechanical formula using past income and standard IRS expense allowances, but the law did not detail what to do when a filer's forward-looking income or actual expenses deviated from the mechanical calculations (Leyba, 2012; Radwan, 2012). Two Supreme Court cases resolved some of the issues, ruling that courts can use forward-looking incomes to calculate plan payments when there are

discrepancies between past income and forward-looking income, and that filers cannot deduct IRS allowable vehicle ownership expenses when the filer does not have a lease or car payment. Still differences across districts in disposable income calculations remain.[51] Two approaches exist to resolving issues with the IRS standard expenses (Radwan, 2012): (i) the cap approach, which deducts from income the minimum of the actual and IRS standard expenses, and (ii) the allowance approach, which deducts the IRS standard expenses, even if actual expenses are below the allowance. Courts uniformly prohibit the debtor from including expenses in excess of the allowance amounts, except for mortgage expenses which are allowed to exceed the IRS standard (Radwan, 2012).

For above-median income filers, our goal is to calculate projected disposable income in a way that adheres to common practices and is possible to compute with the available data. In all districts, disposable income is some measure of the filers monthly income less reasonable expenses. For monthly income, we use the filer's forward-looking average monthly income reported on Schedule I. While, technically, the formulaic approach for above-median filers uses the gross current monthly income (CMI) reported on form 122 with adjustments for deductions, the Schedule I income closely approximates this adjusted net income.[52]

For expenses, we adopt the cap approach to IRS standard expenses. Specifically, we first calculate the IRS standard expenses, which depend on the filer's family size, the number of family members above age 65, the number of vehicles, and the county of residence. We assume that single filers have a family size of one and joint filers have a family size of two, that everyone is below age 65, and that each person has one vehicle. These assumptions, combined with the filer's county, allow us to calculate the formulaic portion of the standard expenses. The bankruptcy expense calculations then allow filers to adjust the formulaic portion with selected allowable expenses, the largest of which is the mortgage payment. For the mortgage payment, we calculate the monthly expenditure assuming that the filer financed the total value of the reported real property using a 30-year standard mortgage with a 6% down payment and a 7% interest rate.[53] We then set the IRS mortgage payment as the maximum of the estimated mortgage payment and the IRS standard mortgage/rent expense for the filer's county. This provides an estimate of the filer's formulaic IRS expenses. To implement the cap approach, we then set the filer's expenses to the minimum

[51] Lanning examines the mechanical vs. forward-looking in a case involving a change in income, while Ransom v. FIA Card Services examines the issue with respect to actual vs. IRS standard allowable expenses.

[52] There are two reasons to prefer the Schedule I income over form 122 current monthly income when calculating projected disposable income. First, only gross current monthly income is available in the FJC bankruptcy data, while the appropriate income measure would be the net current monthly income after subtracting taxes, involuntary payroll deductions, domestic support obligations, etc. Schedule I income already net of these adjustments. Second, using Schedule I income is consistent with the forward-looking approach adopted in many districts. Thus, we think Schedule I income is a more accurate reflection of the actual income level used for determining chapter 13 plan payments.

[53] If the filer's secured debt amounts to less than 10% of his or her total debt, we set the predicted mortgage payment to zero.

of the IRS expenses and the actual expenses reported in Schedule J. For above median-income filers, we then subtract these cap-approach expenses from the average monthly income reported in Schedule I.

Appendix G.3.2 Chapter 13 Plan Durations

Section 1322(d) of the bankruptcy code sets the baseline plan duration as three years for filers with current monthly income below the state median income (adjusted for household size) and five years for those with above-median income (Tabb, 2020). However, below-median filers' plans can be extended for "cause," which can include greater payment ability, the filer needing a longer plan to pay priority debts or cure defaults, or to repay a certain share to unsecured creditors.[54] Additionally, the Bankruptcy Code does not include a minimum plan duration, and filers may have shorter plans confirmed if, for example, they are able to repay unsecured creditors in full. Figure G1 plots the distributions of Chapter 13 plan durations for successfully discharged Chapter 13 plans.

[54]Tabb (2020) notes that debtors who repay at least 70% to general unsecured creditors avoid the 6-year bar for a subsequent bankruptcy discharge.

Figure G1: Plan Durations for Discharged Chapter 13 Plans